ORIGINAL

E000026241

MEMORANDUM

TO: Docket Control

FROM: Elijah O. Abinah
Director
Utilities Division

DATE: April 26, 2023

RE: IN THE MATTER OF SUMMER PREPAREDNESS, WINTER PREPAREDNESS, AND WATER PREPAREDNESS FOR THE YEAR 2023. (DOCKET NO. W-99999A-23-0018)

SUBJECT: APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS SPECIAL OPEN MEETING

Please find attached copies of the presentations from the Arizona Corporation Commission's Energy Reliability Summit and Summer 2023 Energy Preparedness Special Open Meeting held on April 24, 2023.

For any questions concerning this matter, please contact Luke Hutchison at (602) 542-4382 or at LHutchison@azcc.gov.

EOA:LH:elr/

Originator: Luke Hutchison

Attachments

ACC - Docket Control - Received 4/26/2023 4:38 PM
ACC - Docket Control - Docketed 4/26/2023 4:48 PM

ATTACHMENT

WESTERN ELECTRICITY COORDINATING COUNCIL (WECC)

APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS WORKSHOP

PRESENTATION

<Public>

WECC

WECC Reliability Risk Priorities

ACC Energy Reliability Summit and Summer 2023 Energy Preparedness – April 2023

Branden Sudduth

VP, Reliability Planning and Performance Analysis

WECC's Evolution

1967: WECC was formed by 40 power systems, then known as the Western Systems Coordinating Council (WSCC).

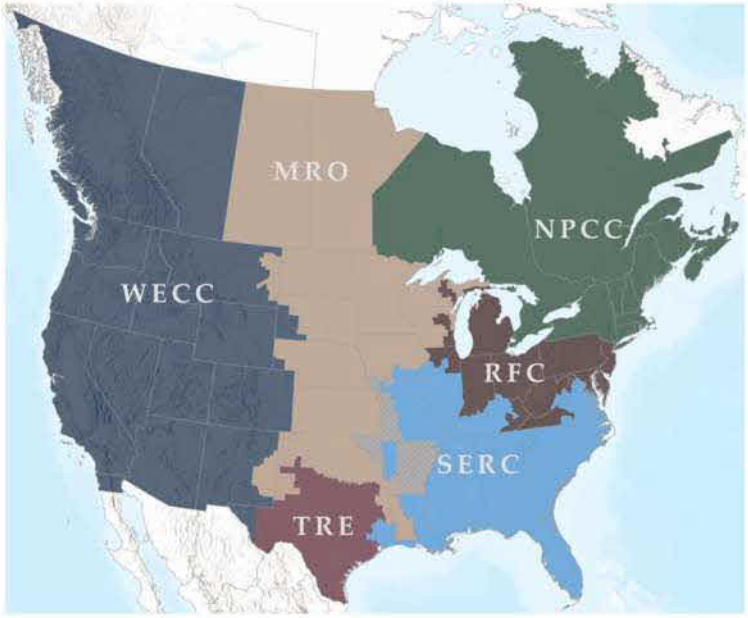
2002: The WSCC became WECC when three regional transmission associations merged.

2007: WECC was designated a Regional Entity for the Western Interconnection. NERC delegated authority it had received from FERC to create, monitor and enforce reliability standards and perform other reliability responsibilities.

2014 and beyond: WECC is an independent organization that partners with stakeholders across the West to further the shared priority of grid reliability and security.

WECC's Delegated Authority

- In 2005, the Federal Power Act, Section 215, called for mandatory reliability standards
- FERC certified NERC as the "Electric Reliability Organization"
- NERC delegated authority to WECC as the Western Interconnection regional entity, responsible for:
  - Standards Development, Monitoring, and Enforcement
  - Reliability Assessments



Reliability Risk Priorities

Cyber and Physical Security - 2022

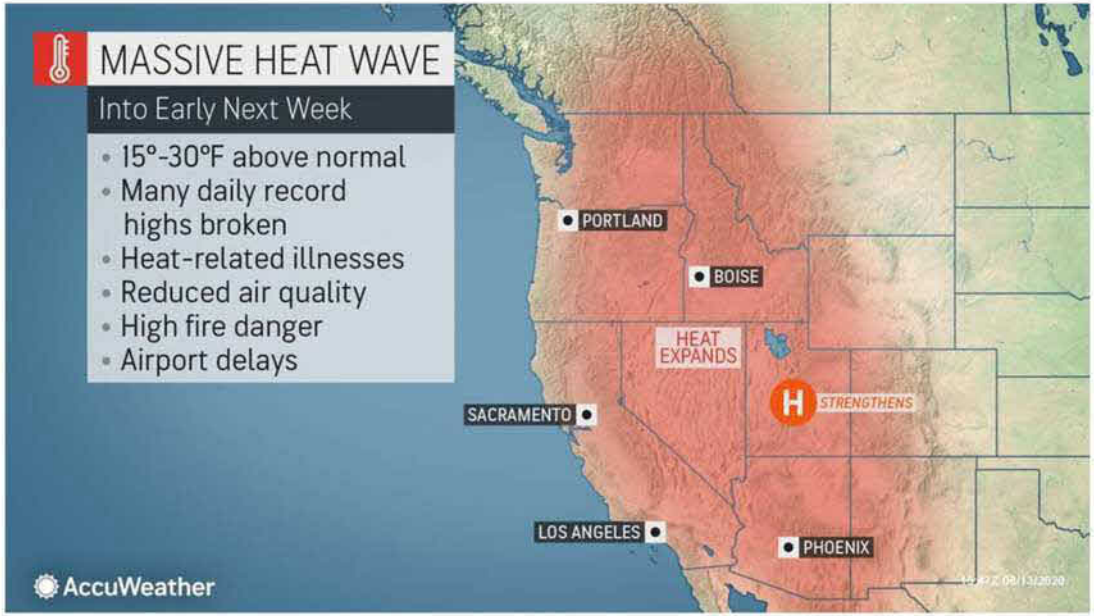
- Increasing cyber threats and reported attacks on the Bulk Power System (BPS)
- Physical attacks to BPS facilities increased by 83% in 2022
  - Significant increase in November and December

2022 Reported Cyber Events (DOE-417)

Month	Description	BPS Impact
January	Malware	None. Detected and removed.
March	Cyber-attack on vendor	Interrupted vendor's access to SCADA data.
June	Cyber-attack on corporate email and telephone service	None. Backup system used.
August	Cyber-attack on vendor.	Non-BPS. Disruption of vendor VER forecast delivery.
September	Ransomware attack on corporate communications	None. Backup systems used.

Case Study: August 2020 Heatwave Event

- Extremely hot conditions across the West
- Firm load was shed on Aug 14 (1,087 MW) and Aug 15 (692 MW)
- WECC Summer Peak Load occurred on Aug 18 at 162,017 MW



Source: https://www.abc10.com/article/weather/accuweather/heat-wave-weather-forecast-western-us/507-f22bddea-cbed-4122-9828-0d60ae22a887

Case Study: September 2022 Heatwave Event

- New interconnection peak load demand record

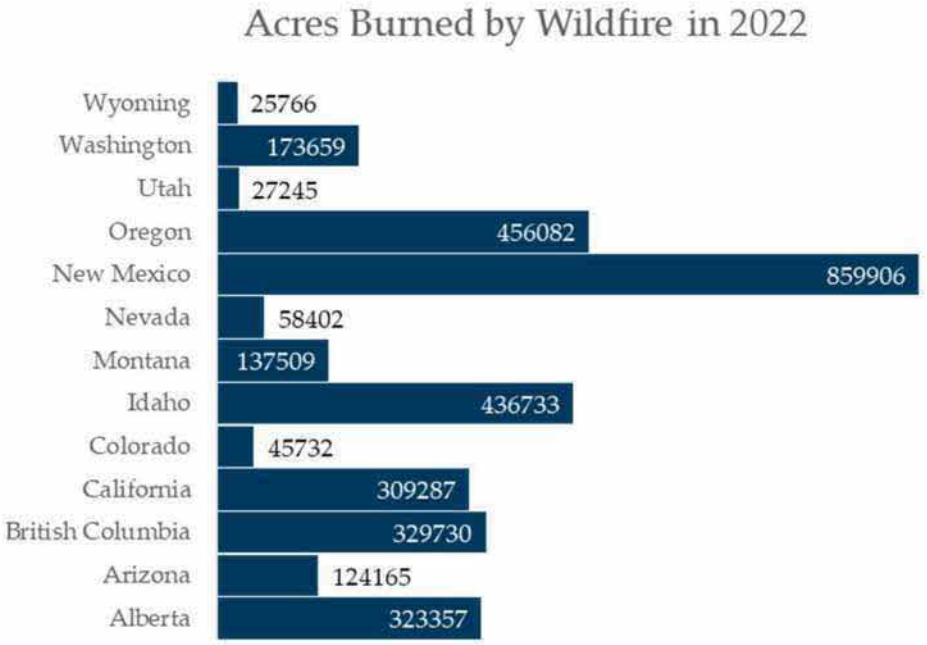
New Record	New Record Date
167,530 MW	September 6, 2022

Previous Record	Previous Date
162,017 MW	August 18, 2020

Source: https://www.washingtonpost.com/climate-environment/2022/09/08/western-heatwave-records-california-climate/

Wildfire Threats to the BPS

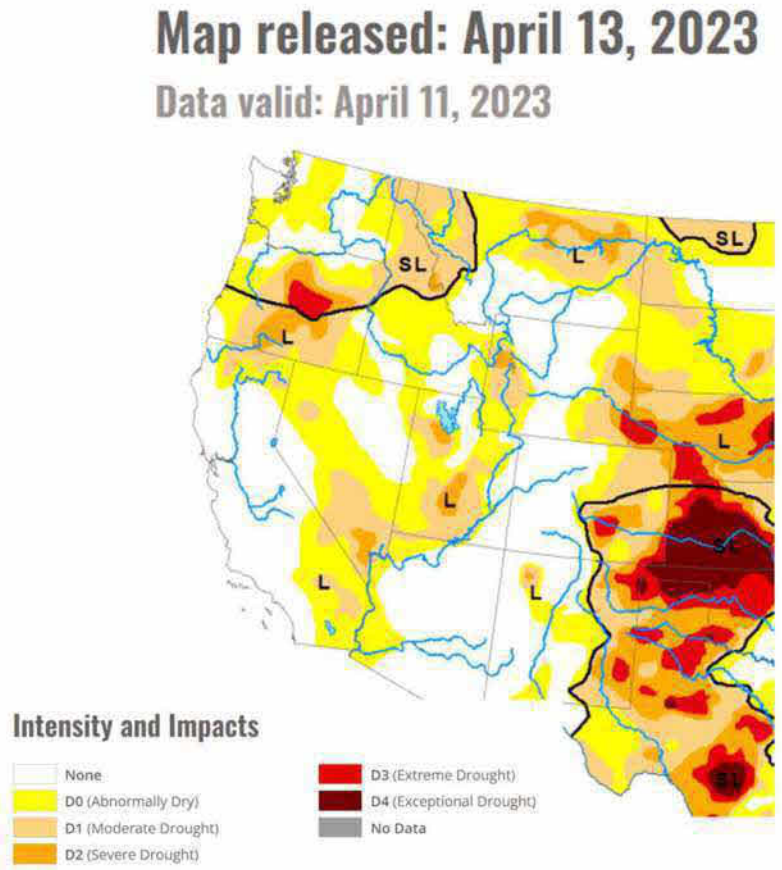
- WECC Data Collection
  - No strong correlation between the number or size of wildfires and impact to the BPS
- Significant industry focus on reducing wildfire impacts
  - System hardening
  - Public Safety Power Shutoffs (or similar programs)



Drought and Aridification*

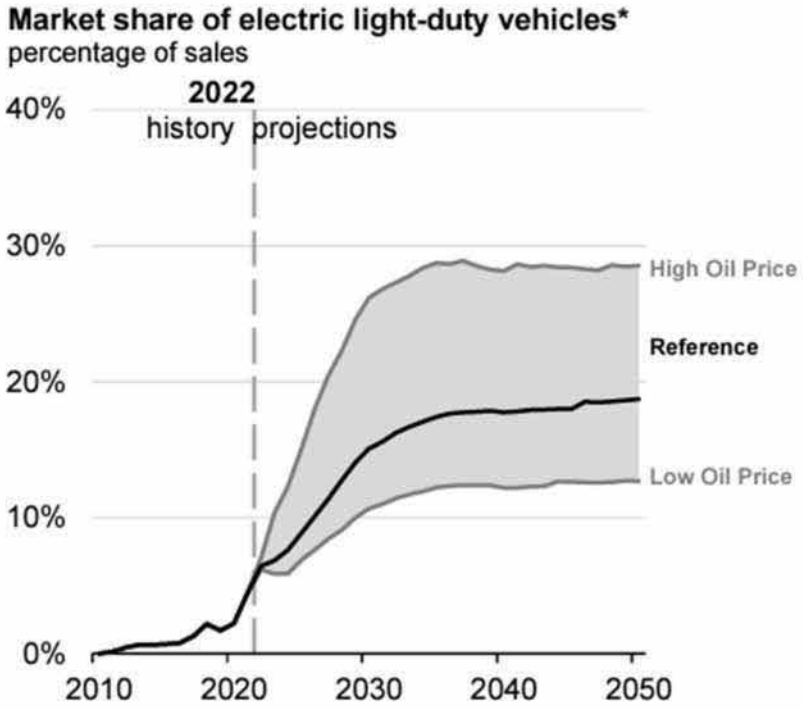
- Hoover Dam (Lake Mead)
  - Minimum Power Pool Elevation: 950 ft
  - Current level: 1047 ft
  - Nameplate capacity: ~2,080 MW
- Glen Canyon Dam (Lake Powell)
  - Minimum Power Pool Elevation: 3,490 ft
  - Current level: 3,520 ft
  - Nameplate capacity: ~1,020 MW

*Data as of April 13, 2023



Source: US Drought Monitor https://droughtmonitor.unl.edu

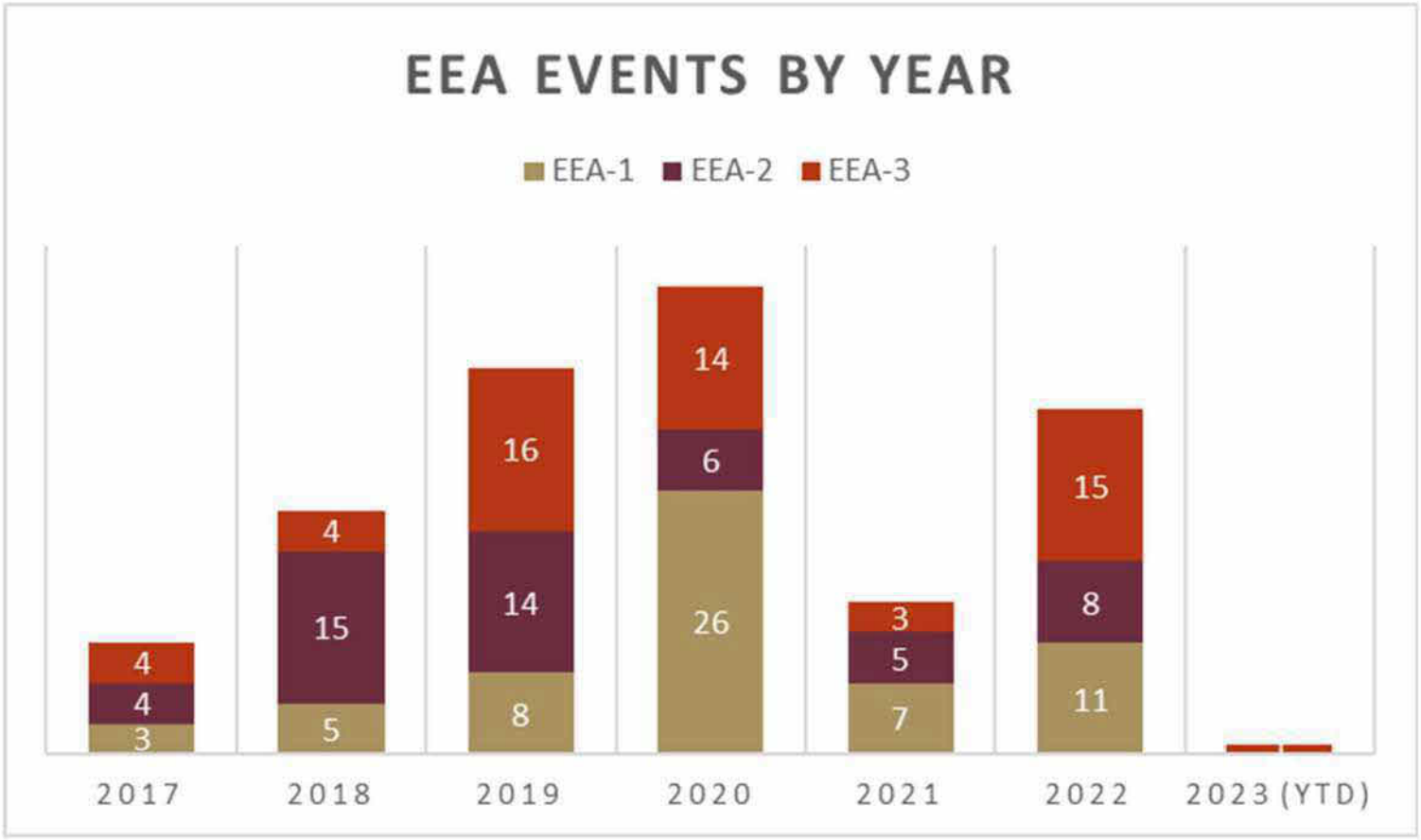
Vehicle Electrification



Source: U.S. Energy Infrastructure Administration (AEO2023)

- BPS Considerations
  - Affect on load growth and demand curves
  - Charging infrastructure
  - Behavior during system disturbances
  - Opportunities to enhance reliability

Energy Emergency Alert Events



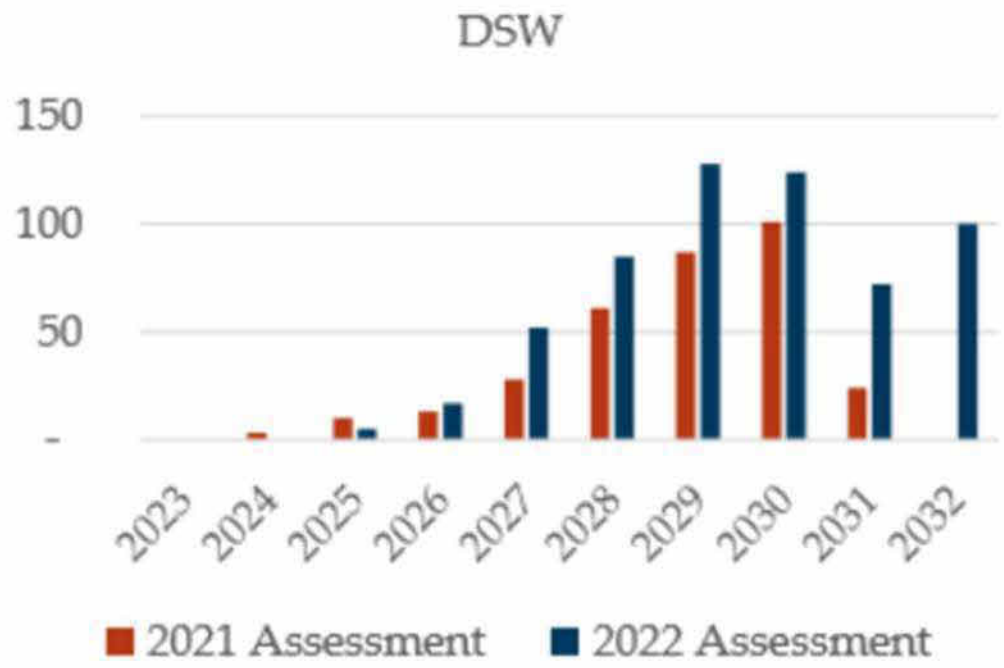
Western Assessment of Resource Adequacy

- High-level assessment that identifies and characterizes resource adequacy risks
- Assessment footprint
  - Western Interconnection
  - Five subregions
- 10-year, hourly analysis (2023-2032)
- Probabilistic approach
- Energy-based approach
  - Account for variability
  - Complement capacity-based approaches
- Data comes from WECC Balancing Authorities
  - Includes expected demand and resource information

Resource Adequacy Overview

- While there has been some improvement in near-term (2–3 years) demand-at-risk hours, risk has not been eliminated
  - Actions like retirement delays and expedited building of resources
  - Reduced load forecasts in Pacific Northwest and northern Rocky Mountains
- Likelihood and magnitude of resource adequacy risk has increased compared to previous analyses
- Long-term, the risk increases over the next 10 years
- Variability drives resource adequacy risk, and variability increases over the next decade

Resource Adequacy - Demand at Risk Index



Key Takeaways and Recommendations

- Mitigating increasing resource and demand variability could include:
  - Adding dispatchable resources and/or storage
  - Increasing demand management measures
  - Participating in subregional cooperative efforts
  - Supporting the research and development of new technologies
  - Improving coordination of transmission planning and operation
- Impediments to building planned resources
  - Resource plans should include contingency plans to manage the risk of impediments to building planned resources (e.g., supply chain delays)

Additional Takeaway: Transmission

- The reliance on imports increases in many cases over the next decade
  - Indicated by the increase in demand-at-risk hours
- Under certain circumstances, these imports may not be available
  - Resource availability issues
  - Transmission issues

Recommendation

The West should evaluate resource and transmission adequacy in a coordinated fashion through ***comprehensive, wide-area*** *system planning.*

Electric Reliability and Security for the West

www.wecc.org

ATTACHMENT

ARIZONA PUBLIC SERVICE COMPANY
(APS)

APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS WORKSHOP

PRESENTATION

Arizona Public Service Company
2023 Summer Preparedness

Arizona Corporation Commission

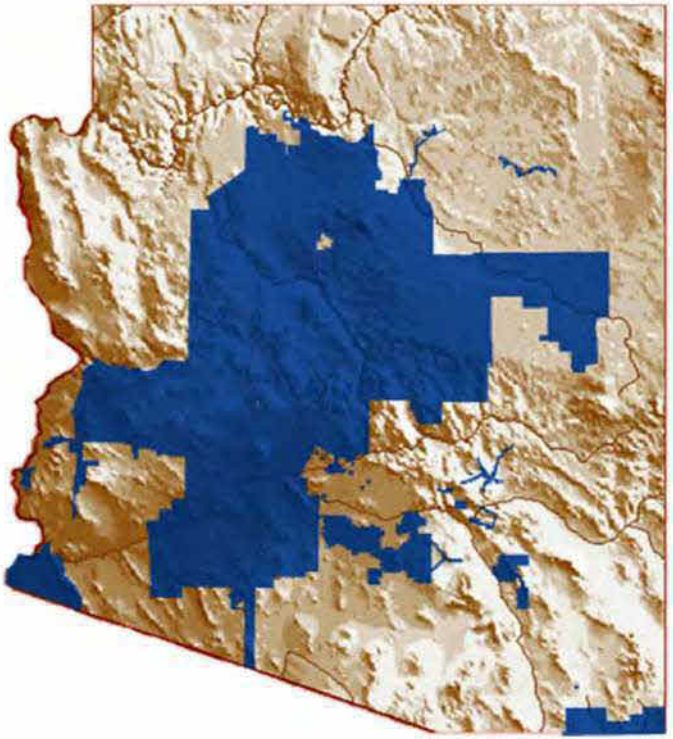
April 24, 2023

Justin Joiner

Vice President, Resource Management

APS Service Territory

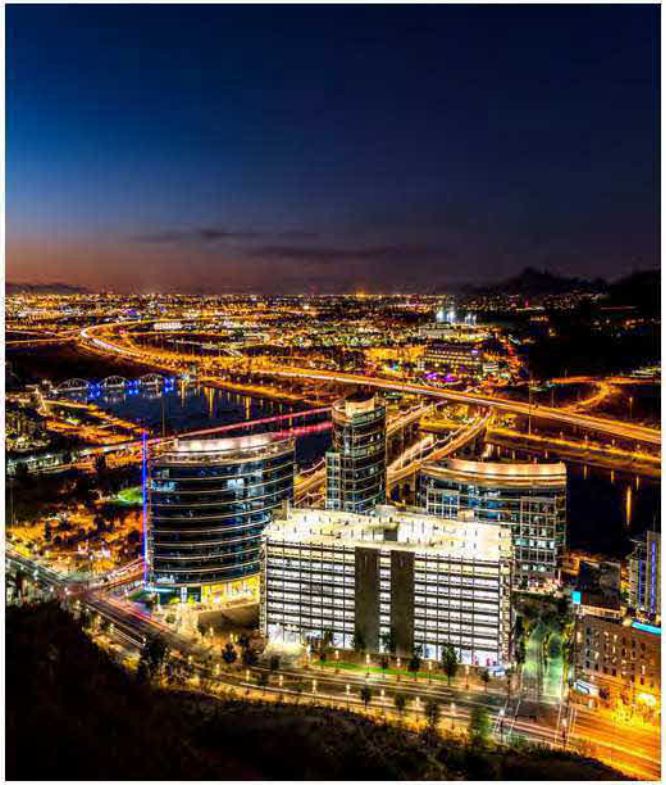
- 11 of Arizona's 15 counties
- 34,646 square mile service area
- Serving more than 1.3 million customers
- Nearly 500 substations; roughly 300,000 transformers; more than 550,000 poles and structures
- Approximately 6,000 miles of transmission lines, 11,000 miles of overhead lines and 23,000 miles of underground cable



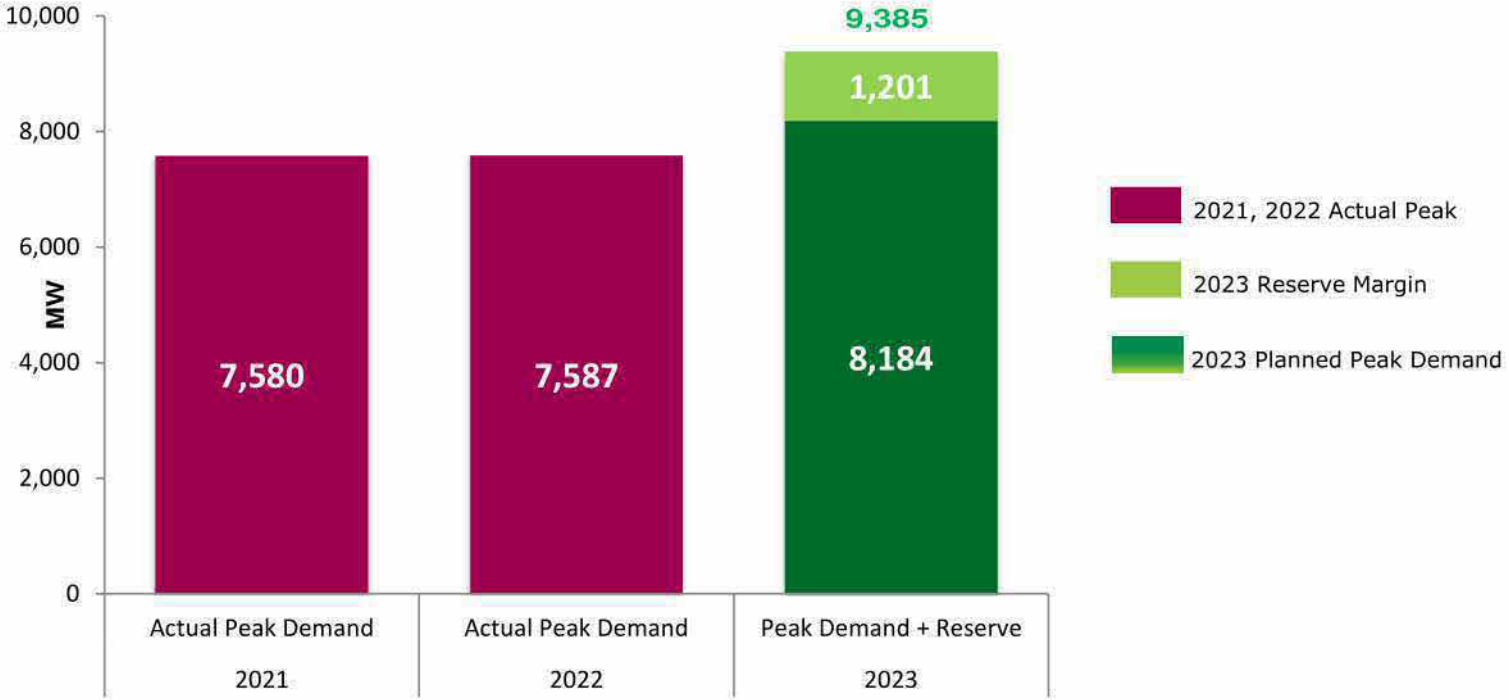
2022 Recap

APS Results

- 1,107 wildfires burned over 125,000 acres
- 884 storm poles replaced May-October
- 17 days of rainfall during monsoon
- Tight capacity conditions
- Customer partnerships contributed to a successful summer
- Focus on resource planning, sufficient reserve margins, fire mitigation, and overall preparedness were key to maintaining reliability



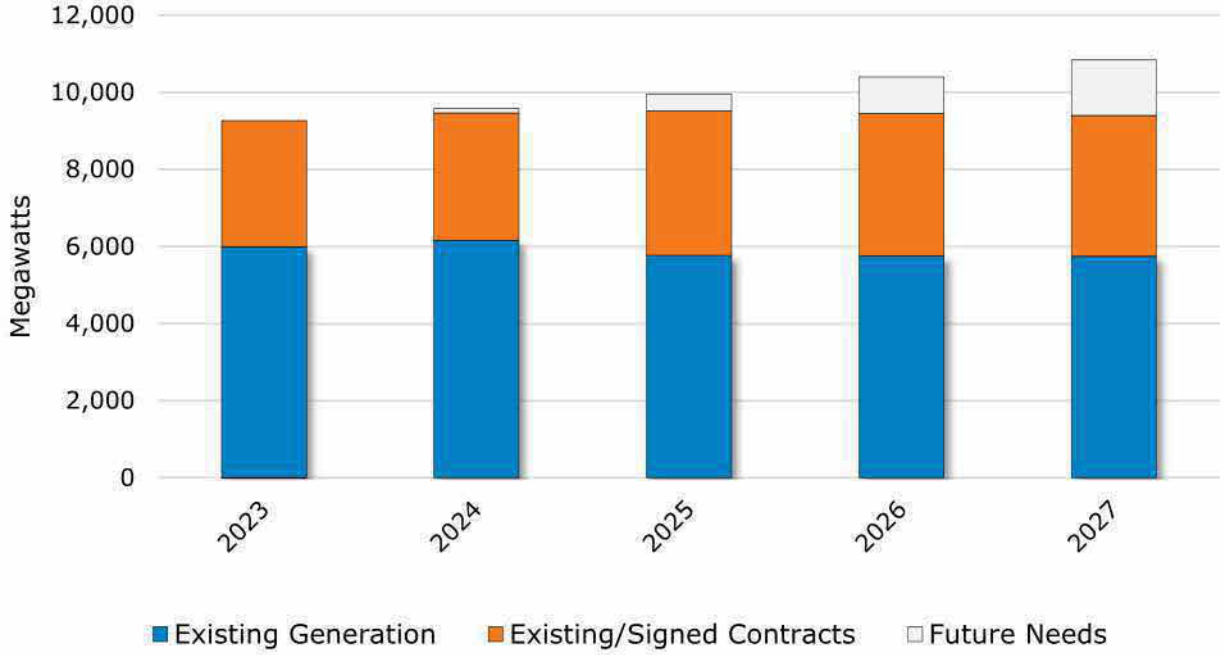
2023 Peak Resources and Demand



2023 APS Resource Diversity

	PEAK CAPACITY	NAMEPLATE CAPACITY
Nuclear	**1,146**	**1,146**
Coal	**1,347**	**1,347**
Natural Gas	**5,120**	**5,239**
APS Owned	3,347	3,466
PPAs	1,773	1,773
Short-term Purchases	**713**	**713**
Microgrid (Quick Start)	**42**	**42**
Renewables	**669**	**1,440**
Solar	439	737
APS Owned Solar	*189*	*378*
Solar PPAs	*250*	*359*
Wind (PPAs)	147	620
Solar + Storage (PPA)	60	60
Other (PPAs)	23	24
Energy Storage	**128**	**265**
Incremental Customer-Based	**237**	**499**
Energy Efficiency	132	132
Distributed Energy	9	217
Demand Response	96	123
TOTAL	**9,402**	**10,292**

Projected Resource Needs



Based on 2023 Q1 Load Forecast

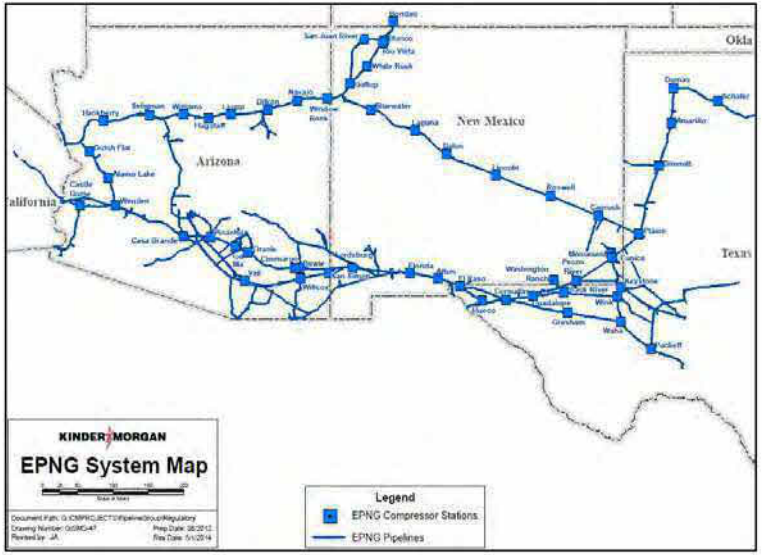
Securing a Balanced Resource Mix

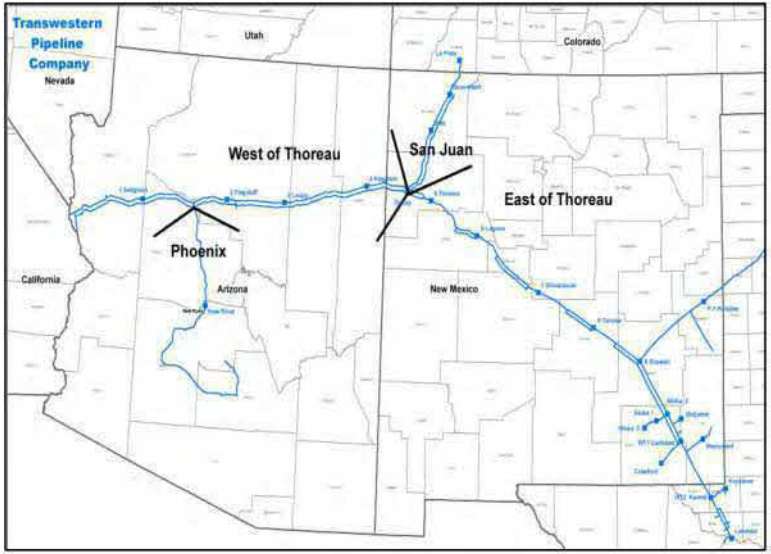
- **2023 Integrated Resource Plan**
  - In development
- **Expanding Clean, DSM Resources**
  - Currently contracted for 1,672 MW clean resources in service 2023-2025
  - Upscaling demand response, load management customer programs to leverage energy storage
- **2023 All-Source RFP**
  - To be released in late Q2; focus on resources in service in 2027-2028
- **Flexible natural gas generation**
  - Extended two summer tolling power purchase agreements

APS has adequate fuel supply for all its generating facilities

- **Conventional Generation**
  - Fuel contracts in place for APS owned and other generating facilities
- **Palo Verde Generation**
  - Palo Verde has a secure supply of enriched uranium product from contracts and inventory to feed reloads through 2026

APS Natural Gas Supply and Transport





- Primary firm gas transportation contracts on three interstate gas pipelines:
  El Paso, Transwestern, North Baja (not pictured)
- Access to San Juan and Permian gas supply basins
- Firm gas transportation contracts to meet annual peak needs

Power Plant (Non-Nuclear) Summer Readiness

All summer readiness activities will be completed by May 1

Preparedness Activities

- Provide employees extreme temperature protective equipment
- Train and prepare employees for extreme weather conditions
- Walkdown and verify systems and plant conditions
- Incorporate lessons learned
- Survey critical control systems
- Identify/prepare critical spares

Transmission & Distribution

- **Preventive Maintenance**
  - Employ technology to more quickly identify and restore outages
  - Completed summer-specific maintenance
  - Completed summer-specific patrols and inspections
- **Operational Strategies**
  - Execute planned outages and implement extreme heat day procedures
  - Strategic staffing
  - Maintain sufficient inventory of equipment for summer

Fire Mitigation Preparedness

- **Steps to reduce wildfire risk and create resilient system**
  - Line patrols
  - Defensible space around poles
  - Removing hazardous trees
  - Reclosing strategy
  - Distribution system upgrades
  - Public outreach
  - Technology deployment

Emergency Management

- **External Preparedness and Response**
  - Mutual assistance with neighboring utilities (SRP & TEP)
  - Coordination of summer operating study with nearby utilities
  - Fire and emergency management coordination with various Federal, State, and Local agencies

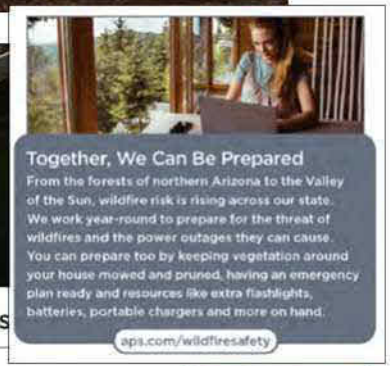
- **Internal Preparedness and Response**
  - Black start system restoration drill
  - Electric Load Curtailment Plan exercise
  - Disaster Recovery Plan exercise

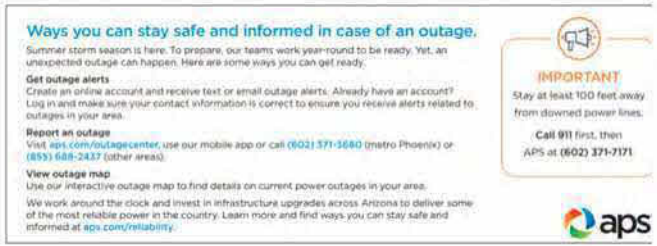
Cyber Security

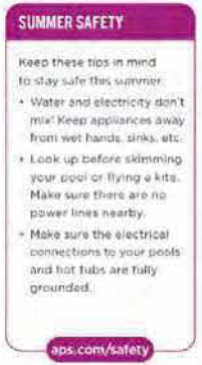
- **Risk Mitigation Process**
- **External Audits and Certification**
- **Coordination on Best Practices and Standards**
  - Utility Industry
  - Regulatory Bodies
  - Federal, State and Local Government Agencies
  - Third-Party Experts

Focus on the Customer

- **Customer care**
  - 24/7 Customer Experience Operations Center
  - Customer alerts by text and email for outages
  - Improved aps.com outage center and interactive outage map
- **Customer education**
  - Communications in multiple channels (English and Spanish) for summer safety, including wildfire, monsoon and outages
- **Heat relief programs and energy efficiency**
  - Community involvement, including expanded heat relief programs and emergency A/C repair assistance







Summary

APS is ready to reliably serve its customers' needs for summer 2023:

- diverse generation resources
- adequate fuel supplies
- transmission capacity
- emergency preparedness

ATTACHMENT

SALT RIVER PROJECT
(SRP)

APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS WORKSHOP

PRESENTATION

SRP – 2023 Summer Preparedness

Arizona Corporation Commission | April 24, 2023

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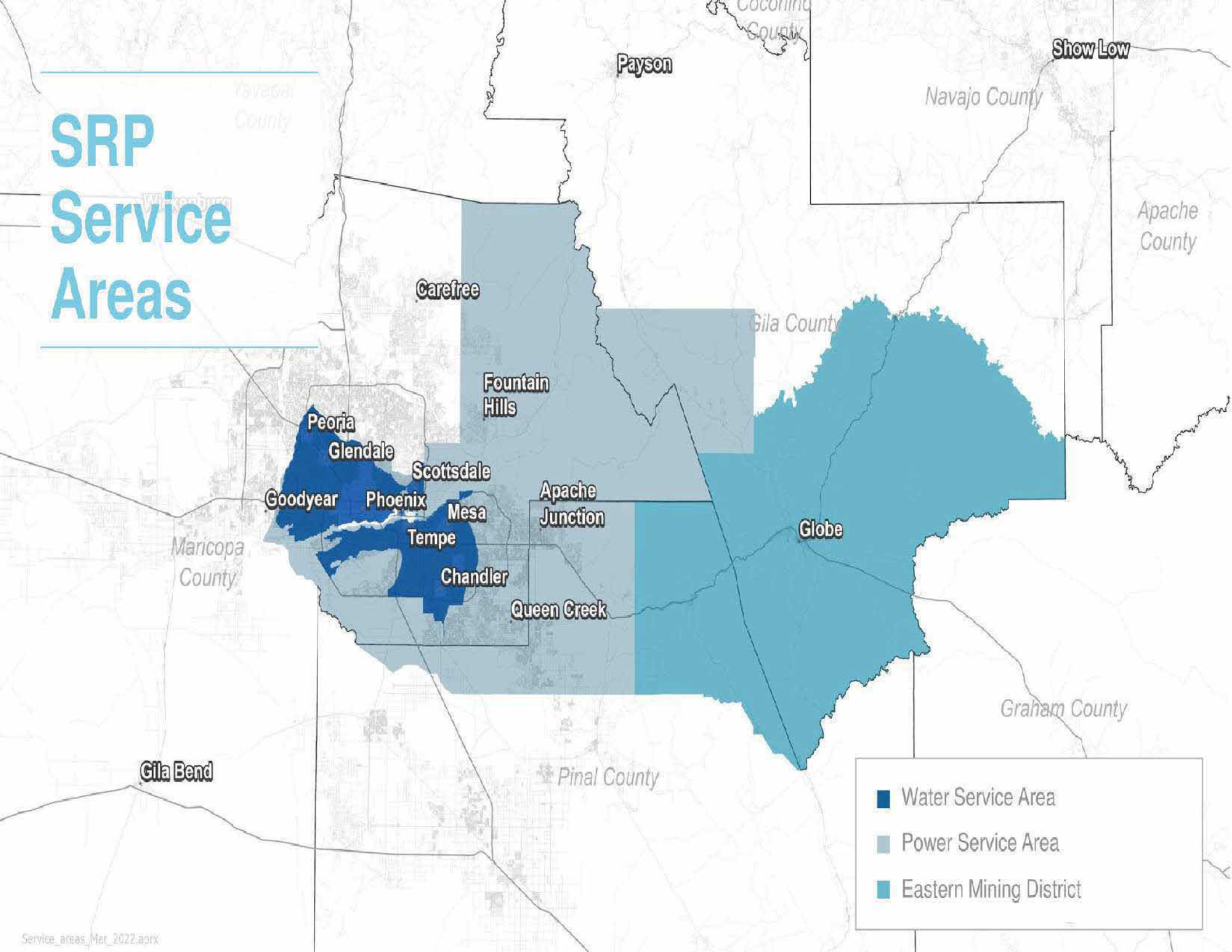
Pam Syrjala

Director Supply, Trading & Fuels

SRP Service Areas



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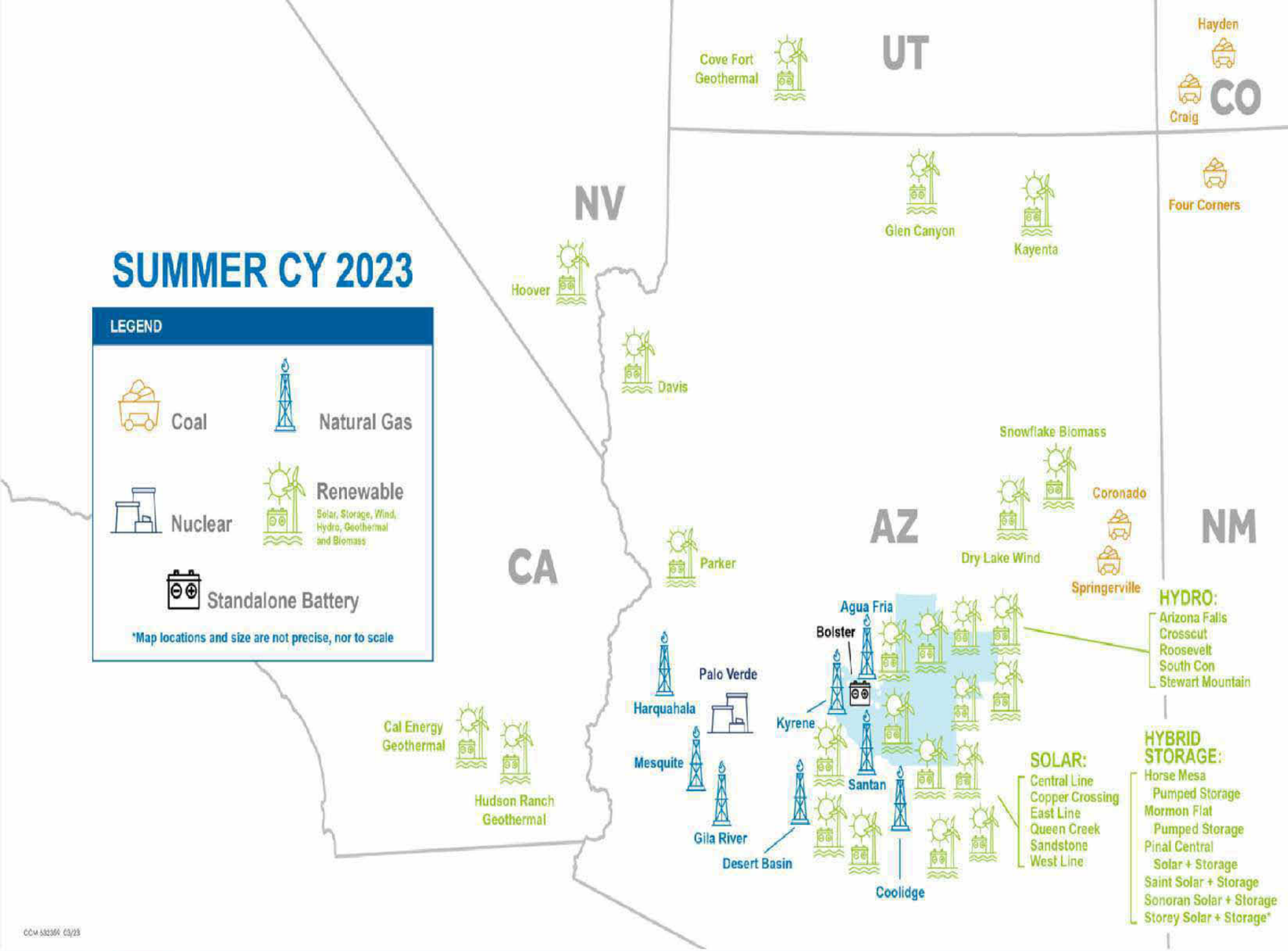
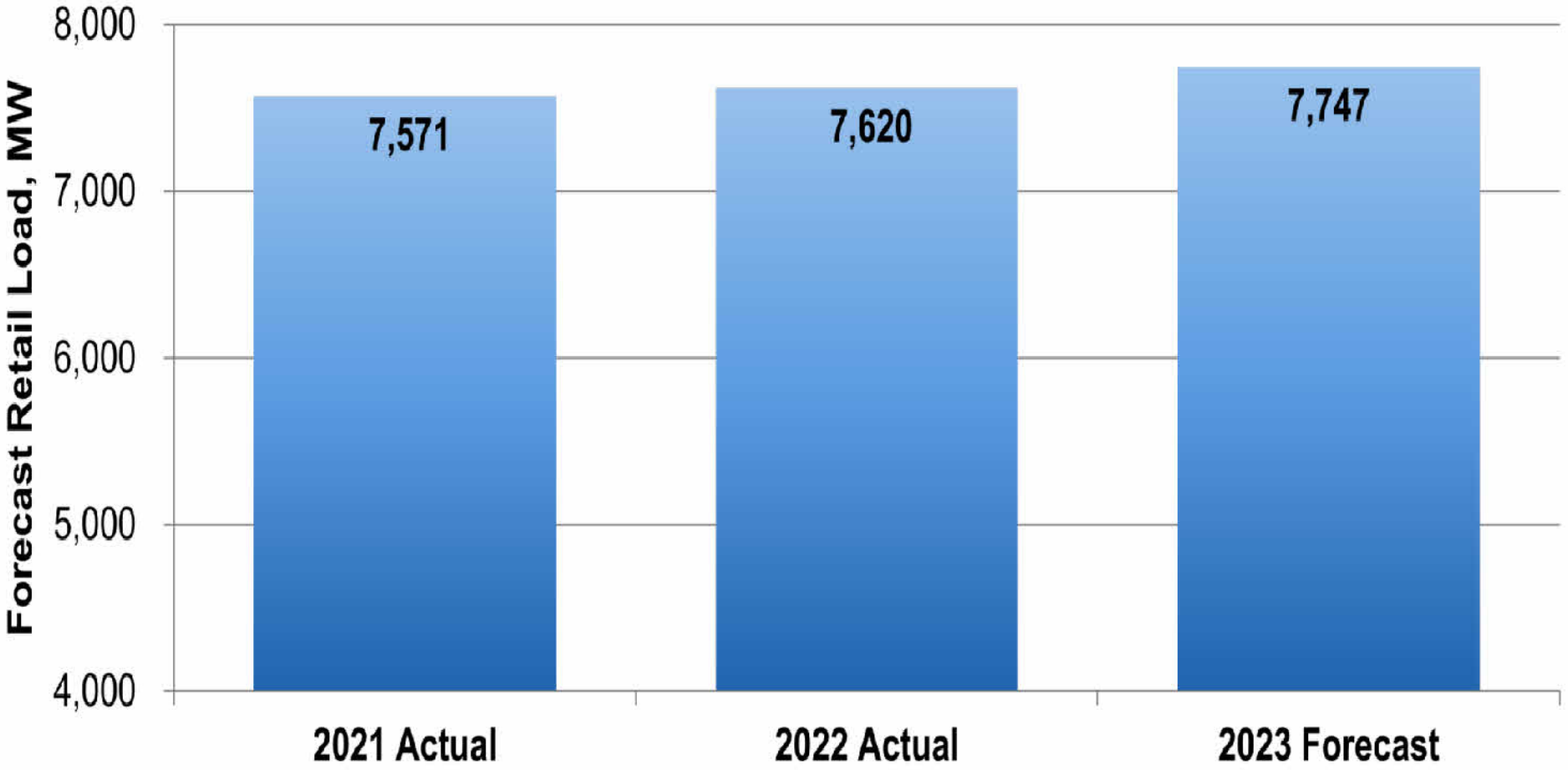
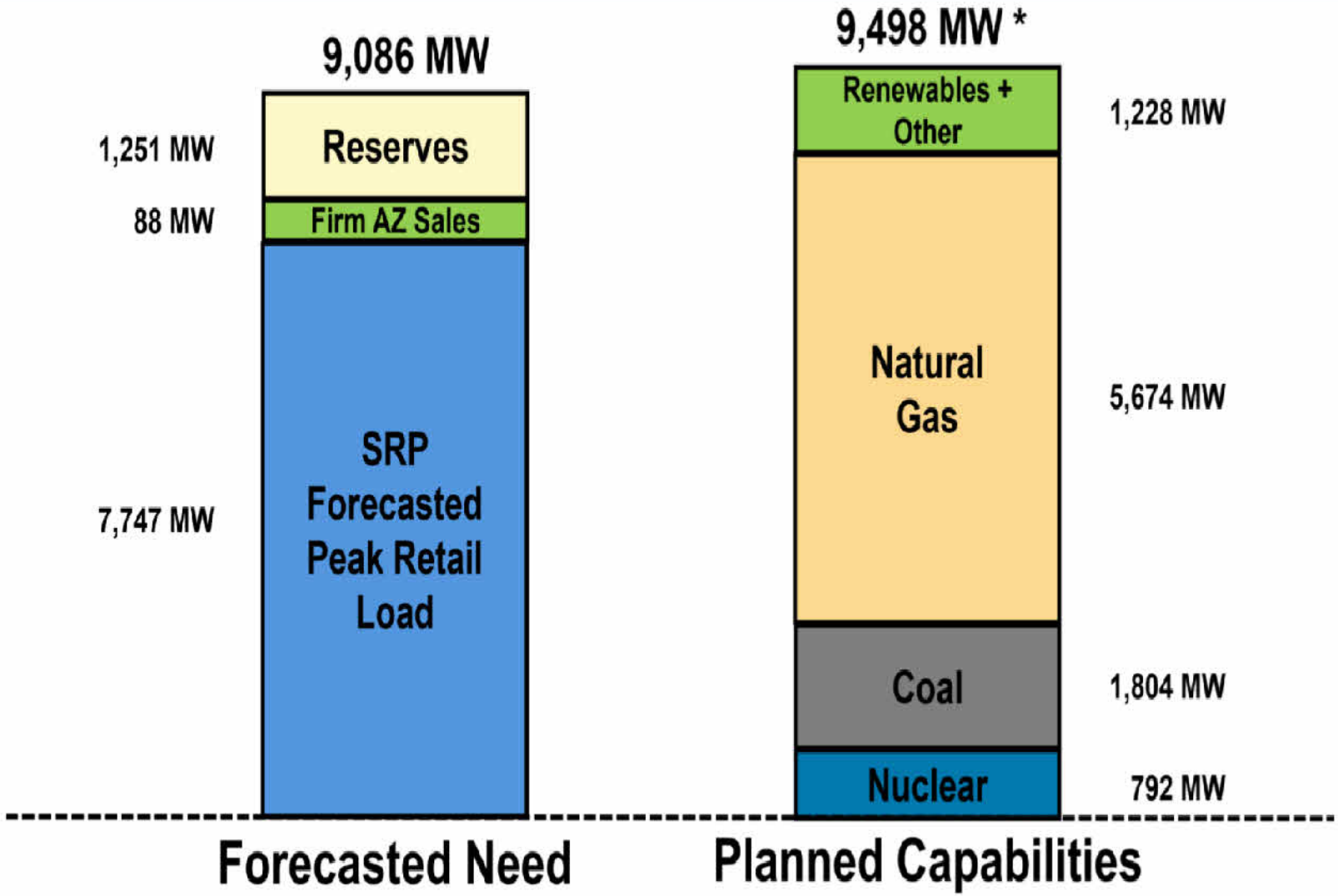


CCM 532364 03/23

Peak Hour Retail Load Forecast



Summer 2023 Outlook



* Up to 400 MW is at risk due to solar delays, supply chain constraints, interconnection challenges, and drought conditions

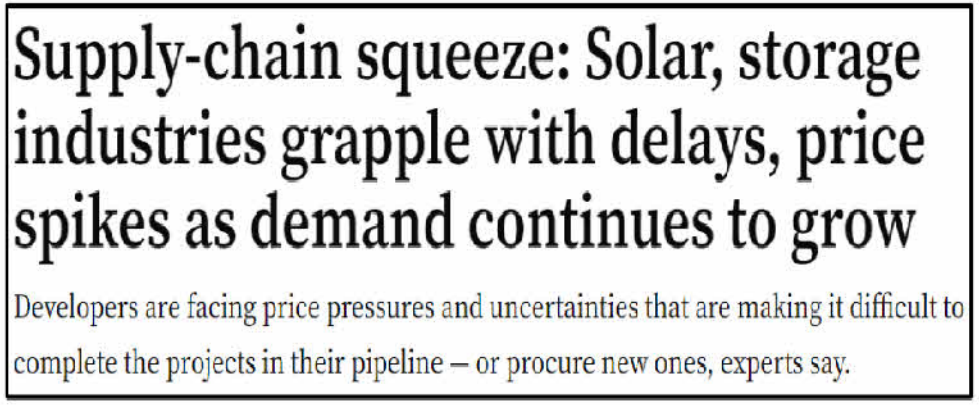
Resource Challenges

- Solar Delays
  - U.S. customs inspections
- Operational Risks
  - Battery technology integration
- Supply Chain Constraints
  - Longer equipment lead times
- Interconnection Challenges
  - Permits, outage coordination
- Drought Conditions
  - Reduced hydro output


Solar Power World

TOP SOLAR CONTRACTORS ARTICLES POLICY MARKETS PRODUCTS SUBSCRIBE

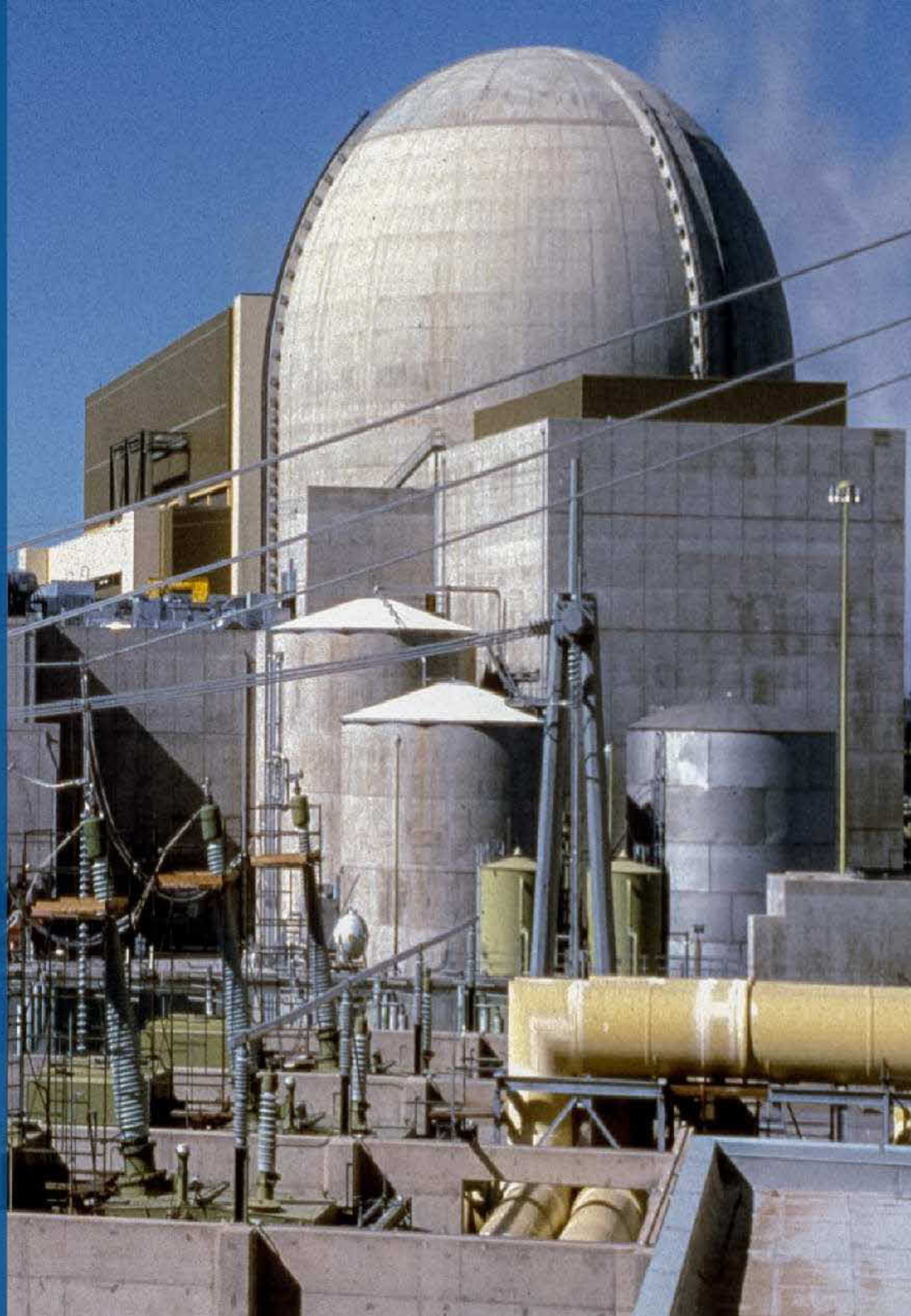
Solar industry prepares for Uyghur Forced Labor Prevention Act implementation


Supply-chain squeeze: Solar, storage industries grapple with delays, price spikes as demand continues to grow

Developers are facing price pressures and uncertainties that are making it difficult to complete the projects in their pipeline – or procure new ones, experts say.

Fuel Status

- **Nuclear** - Full requirements under contract.
- **Coal** - Full requirements under contract. Inventory at coal plants are at/above target levels prior to summer run.

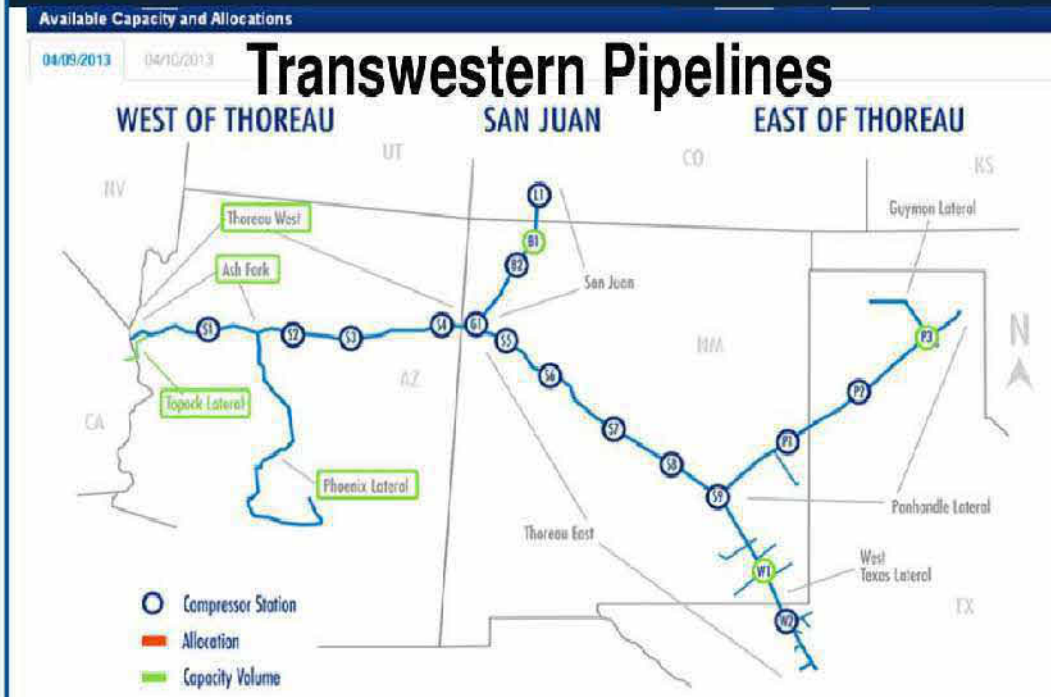


Natural Gas Supply

- Full transport requirements secured balanced between both natural gas pipelines, with access to Permian and San Juan gas basins.
- SRP employs a natural gas hedging program

EPNG Pipelines

Transwestern Pipelines



New Resources

Currently Operational:

- Palo Verde Nuclear Generating Station: 104 MW additional ownership
- West Line: 100 MW Utility-Scale Solar

In Development for 2023:

- Sonoran: 260 MW Utility-Scale Solar and Storage
- Storey: 88 MW Utility-Scale Solar and Storage
- Saint: 100 MW Battery Storage addition to existing 100 MW Utility-Scale Solar

Chris Hofmann

Director, Transmission/Generation Operations

Generation, Transmission & Distribution Readiness

- Asset Management
- Situational Awareness
- Emergency Preparations
- Wildfire Updates

Asset Management

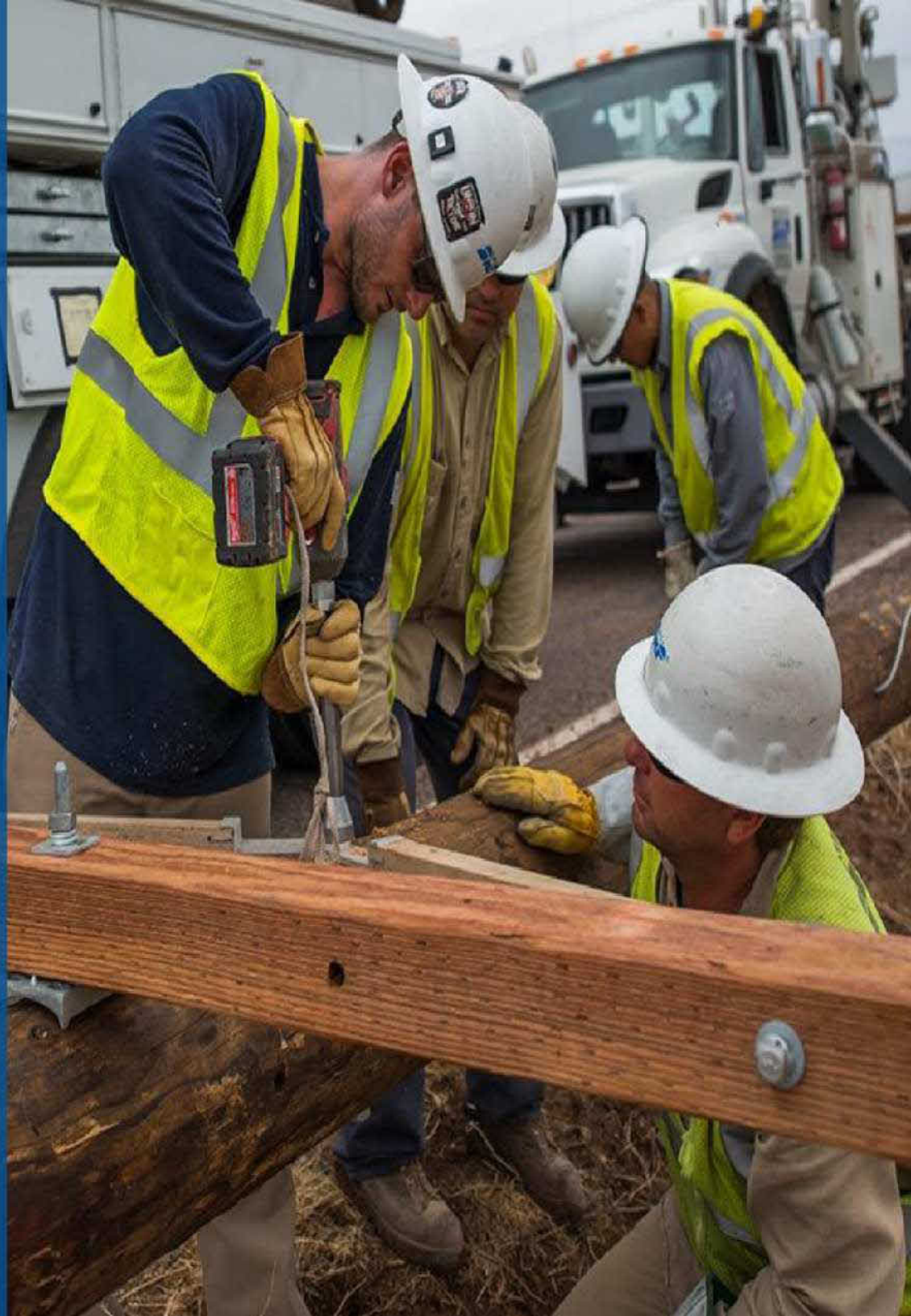
- Risk and Data Based Approach to Equipment Replacements
- Condition & Inspection Based Proactive and Corrective Maintenance
- Other Preventive Maintenance
- Annual Maintenance of Cooling Systems

Situational Awareness

- Daily Operational Briefings / 2X Daily During Extreme Heat
- Inter-Utility Coordination & Support
- Outage Coordination

Emergency Preparations

- Storm, load shed & heat training drills
- Pre-storm equipment staging and staffing



Wildfire Updates

- Application of Lessons Learned
- Agency Collaboration
- Grid Incident Command
- Fire Season Reclosing Policy
- Vegetation Management

SRP is ready and prepared to meet 2023 forecast summer needs

- Fuel is secured
- Energy resources are available to meet peak
- Transmission and distribution assets are prepared
- SRP teams are ready to respond to emergencies

Grant Smedley

Director, Resource Planning, Acquisition and Development

Meeting Near-Term Needs with "AND" Strategy

Solar

Battery Storage

Wind

Harquahala Tolling Agreement

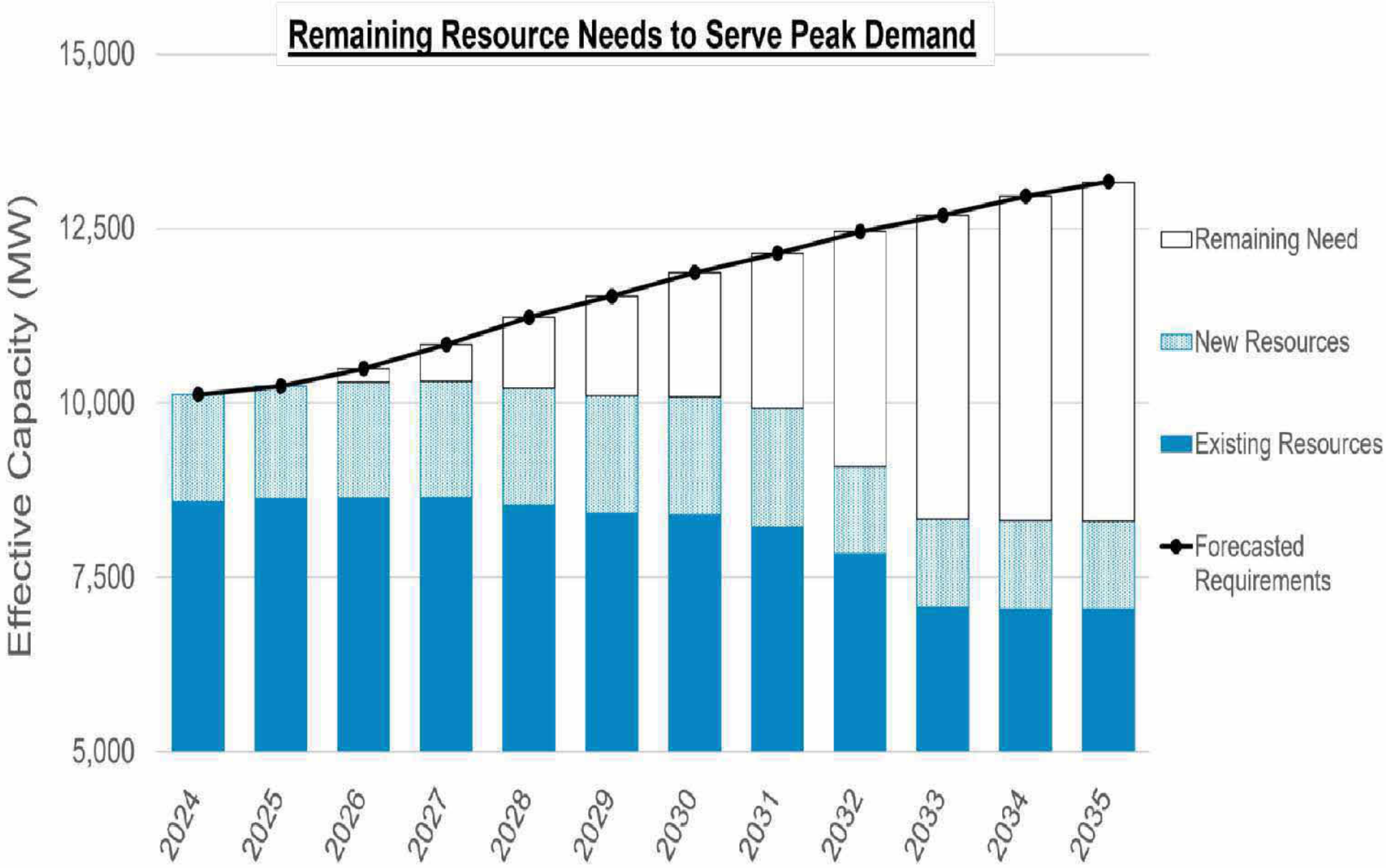
Palo Verde Nuclear

Flexible Natural Gas

Energy Efficiency
And Demand Response

Natural Gas Upgrades

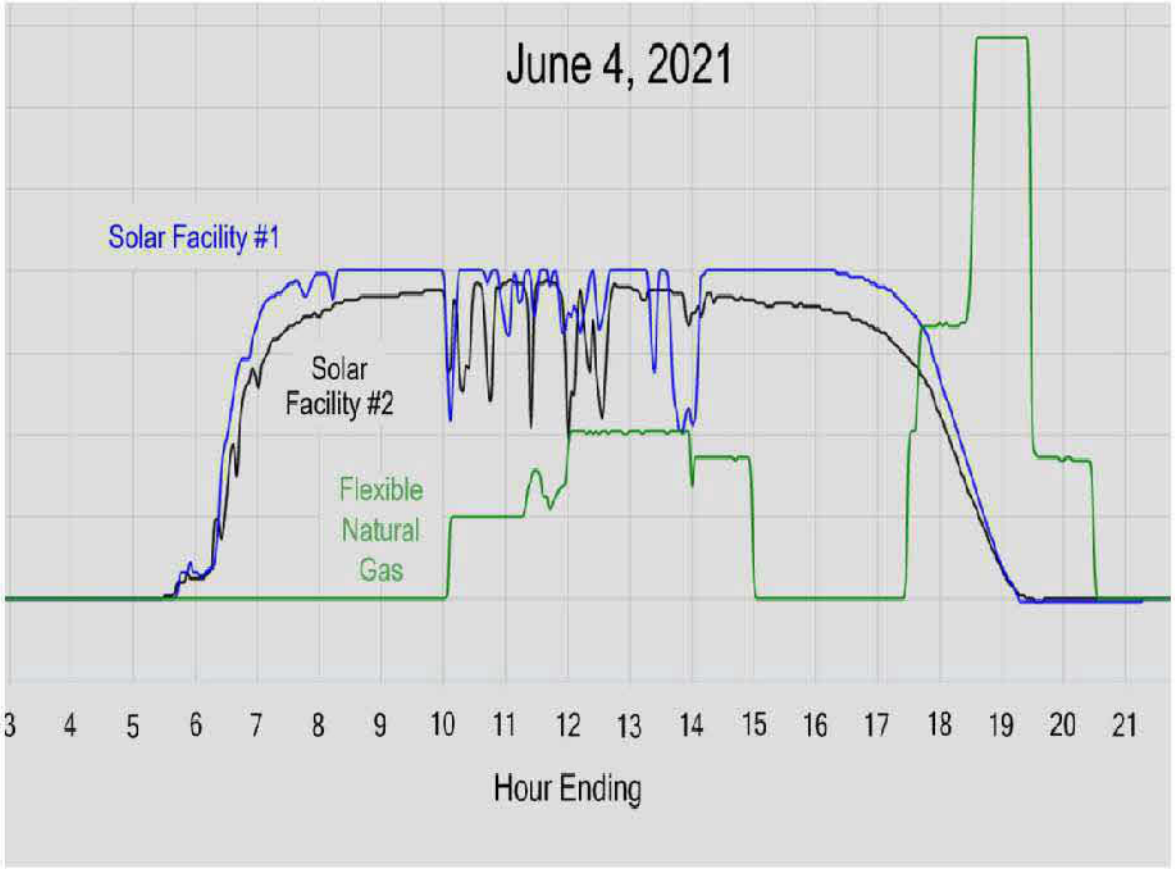
Longer-Term Outlook



Need for Flexible Natural Gas Resources

Three components of reliability must be met:

1. Meet peak customer demand as growth occurs
2. Firm up and balance variable renewable resources being added to the system
3. Respond to unplanned outages and longer-term reliability events



2023 All-Source Request for Proposals (RFP)

- Resources that provide capacity at summer peak
  - At least 200 MW by May 2026
  - At least an additional 300 MW for a total of 500 MW by May 2027
- Resources that provide carbon-free energy to meet customer program needs
  - Up to 500 MW of carbon-free energy by May 2027
- SRP will develop a self-build flexible natural gas option; RFP will be used to identify other alternatives
- SRP retained Power Advocate to administer RFP and support evaluation
- Proposals due late April; recommendation to SRP Board by Q4 2023; CEC in Q1 2024 (if needed)

Key Takeaways

1. SRP is pursuing an "AND" strategy to meet near-term needs created by growth and resource retirements
2. SRP is procuring and developing additional resources to mitigate risks and challenges
3. SRP is collaborating with other entities across the west on resource adequacy and market programs
4. SRP is committed to decarbonization and a transition to a clean energy future, but we must do so in a way that maintains reliability and affordability

thank you!

ATTACHMENT

TUCSON ELECTRIC POWER COMPANY
(TEP)

APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS WORKSHOP

PRESENTATION

2023 Summer Preparedness Workshop

Sam Rugel

Director of System Control & Reliability

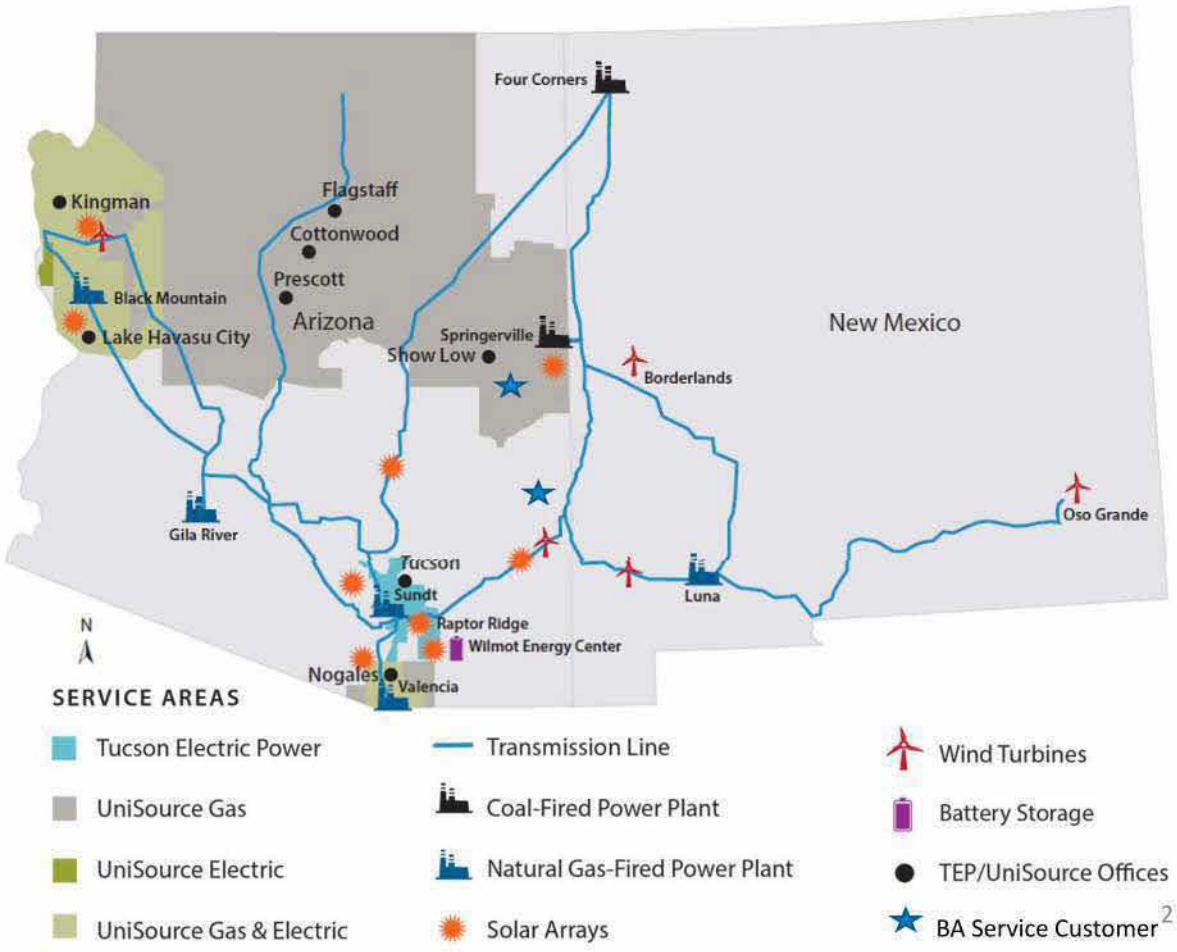
Lee Alter

Lead Supply Side Planner

April 24, 2023

Company Overview

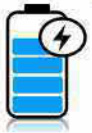
- TEP
  - Over 1,600 employees
  - 443,000 customers in Pima and Cochise Counties
  - Serving Tucson 125+ years
- UniSource Energy
  - Electric and Gas
  - Over 320 employees
  - 269,000 customers in Northern and Southern Arizona
- Joined Fortis in 2014



Comprehensive Planning and Coordination

Pre-Summer Preparations

- Capacity in place for TEP and UNSE for summer of 2023
- Maintenance completed across TEP's generation fleet prior to summer
- 70 days of coal inventory on the ground at TEP's coal-fired generation resources
- Dual fuel backup and procurement procedures are in place
- Black start drills with the Reliability Coordinator
- Communication between physical command center and local/state law enforcement and routine meetings



Real-Time Coordination and Oversight

- Summer Heat Response Team – Generation, System Control, Executive Team, Initiated by Wholesale Marketing
- Coordination between Balancing Authorities, Transmission Operators, and Reliability Coordinators regarding summer loads and unit outage conditions
- Daily communications between Arizona Utilities (Electric & Natural Gas)
- Real-time communication between physical plant and local law enforcement

TEP Tucson Electric Power | UniSourceEnergy SERVICES

2023 Asset Management

New Additions to System

- ✓ 4 Substations

Proactive Replacements

- ✓ 4 Transformers
- ✓ 14 Breakers
- ✓ 6 Battery Banks
- ✓ 6 Chargers
- ✓ 16 Switches
- ✓ 4 Instrumentation Devices

Preventive Maintenance

- ✓ Battery Banks & Chargers
- ✓ Transformers & Breakers
- ✓ Motor Generators
- ✓ Substation Inspections

Supply Chain Strategy

- ✓ Developed mid-range forecast of storm usage
- ✓ Established safety stock levels
- ✓ Coordinated plans with suppliers
- ✓ Plan to address transformer shortages, if necessary

Wildfire Safety

Transmission System Monitoring

- Pre-season coordination engagements
- Work closely with state and federal authorities during wildfire events
- 2,000 ground inspections a year
- Patrol/manage transmission line routes
- Identify potential threats; 24 X 7 monitoring

TEP Tucson Electric Power | UniSourceEnergy SERVICES

2023 Resource Portfolio
Diversified and Evolving

Coal
892 MW
Springerville
Four Corners

Natural Gas
2,115 MW
Gila River Combined Cycle
Luna Combined Cycle
Sundt Engines and CTs
Demoss and North Loop CTs
Black Mountain CTs
Valencia CTs

TEP Tucson Electric Power | UniSourceEnergy SERVICES

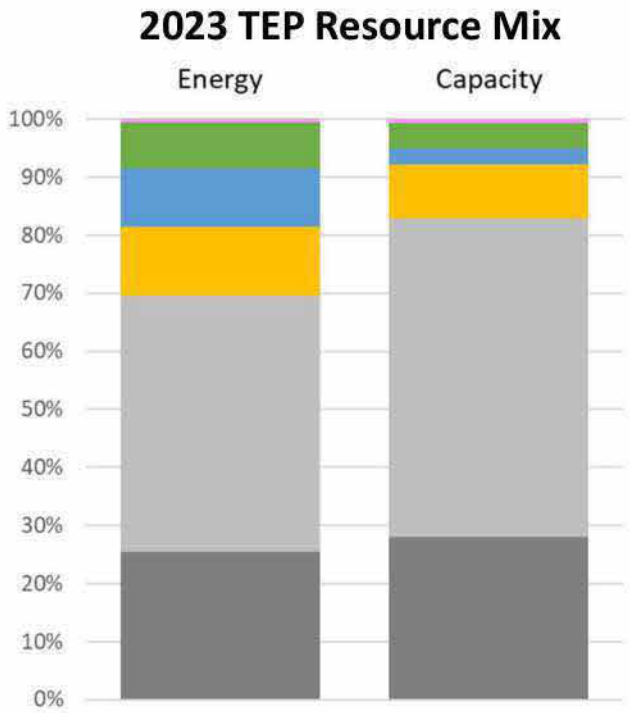
Utility Scale Solar and Storage
464 MW

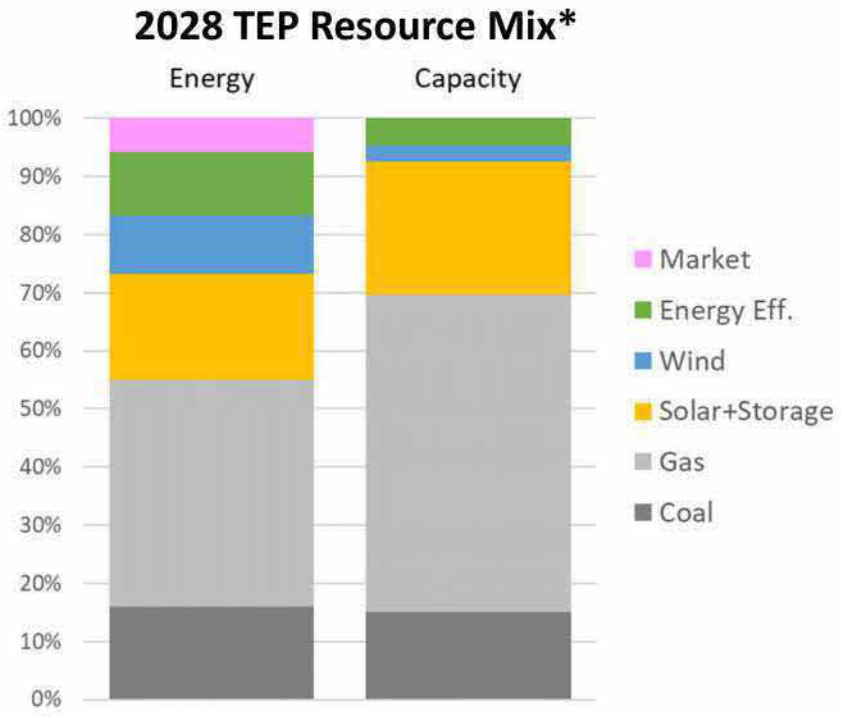
Utility Scale Wind
439 MW

Power Purchase Agreements
375 MW

Retail & Wholesale Demand Response
48 MW

2023 Resource Portfolio
Diversified and Evolving





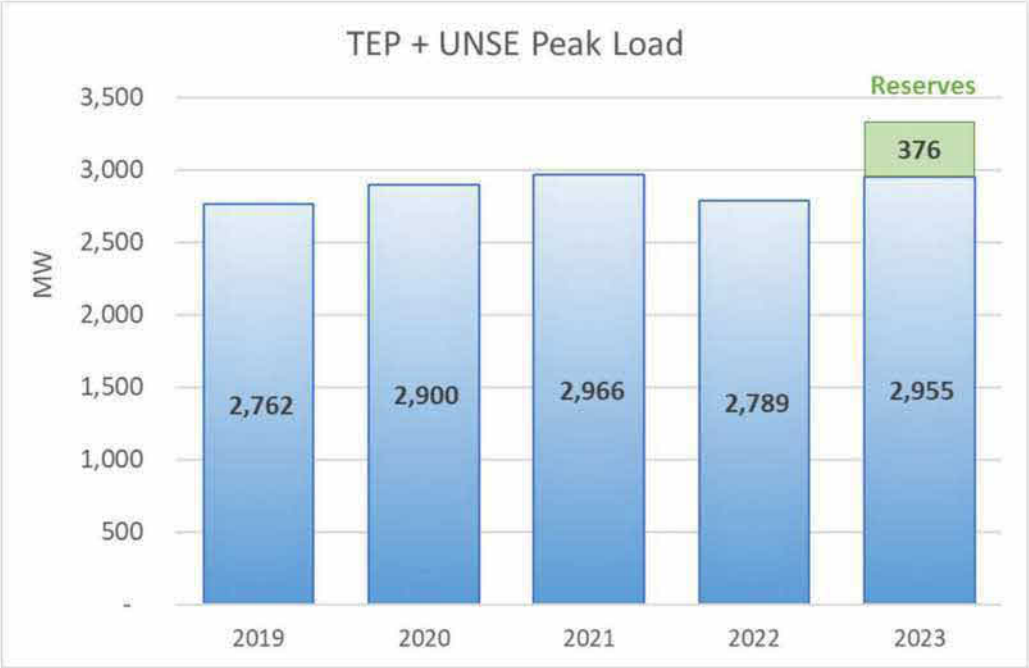
* Dependent on outcome of all-source RFP

TEP Tucson Electric Power | UniSource Energy Services

2023 Reserve Margin

Summer Planning Principles

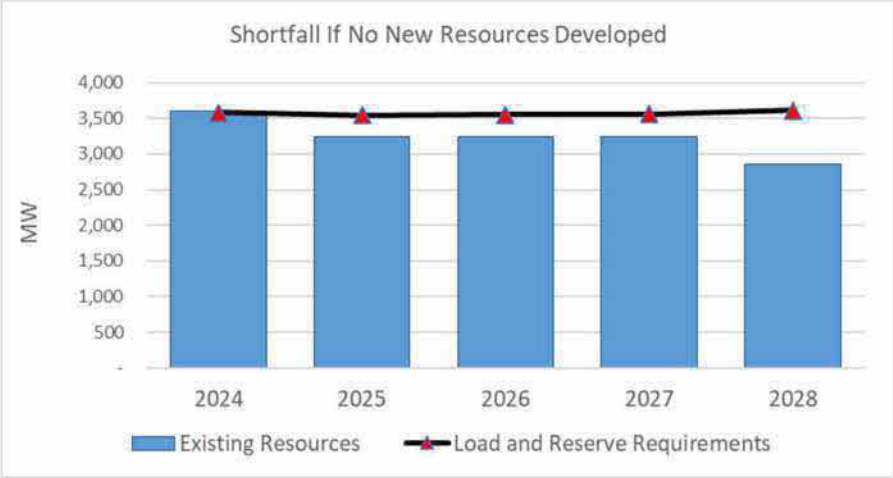
- Base capacity requirement on hotter than normal summer forecast
- Target a reserve margin of 15% or more
- Be able to cover loss of largest single unit
- Seek market source diversity – focused on merchant resources at PV and FC
- Coordinate resource adequacy assessments with other utilities in the region



2023 Reserve Margin	
Hotter than normal summer	13%
Typical summer	17%

Mid-Term Outlook (2024-2028)

- All-Source Request For Proposals (ASRFP) issued in April 2022
- Approximately 160 proposals received for the two companies
- Contracts being negotiated with short-listers
- Expected to fill resource gap in 2025-2026
- A second ASRFP will be issued by the end of this year to address the 2026-2027 gap caused by load growth and planned coal retirements
- 2023 Integrated Resource Plan will lay the groundwork for the next ASRFP and address longer-term issues



TEP Tucson Electric Power | UniSource Energy SERVICES

ATTACHMENT

ARIZONA ELECTRIC POWER COOPERATIVE, INC. (AEPCO)

APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS WORKSHOP

PRESENTATION

Arizona's Cooperatives Summer Preparedness Report

Arizona Corporation Commission
Docket No. W-99999A-23-0018, E-99999A-22-0046

Presented by Katie Hardman
Arizona Electric Power Cooperative, Inc.
April 24, 2023

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Presentation Contents

- AEPCO & Its Members
- Distribution Cooperatives Represented
  - G&T Member Distribution Cooperatives
  - Navopache Electric Cooperative
- Resources & Procurement Update
- 2023 Summer Load & Resources
- Reliability & Readiness
- Fuel & Generation Preparedness
- Transmission & Operational Preparedness
- Energy Imbalance Market
- Near- & Long-Term Risks

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

AEPCO & Its Members

- Arizona Electric Power Cooperative, Inc. (AEPCO) is the not-for-profit Generation and Transmission Owner & Provider for 3 All Requirements Member (ARM) and 3 Partial Requirements Member (PRM) Distribution Cooperatives.
- AEPCO and its Members serve a geographically diverse area – 12 counties, numerous cities, and 8 tribes – with Class A Members accounting for roughly 161,000 meters and 420,000 people.

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Distribution Cooperatives – ARMs

- G&T ***All*** Requirement Members:

Anza Electric Cooperative, Inc.

A Touchstone Energy® Cooperative

Anza, California

Duncan Valley Electric Cooperative, Inc.

A Touchstone Energy® Cooperative

Duncan, Arizona

Graham County Electric Co-op

Pima, Arizona

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

Distribution Cooperatives – PRMs

- G&T ***Partial*** Requirement Members:

Sulphur Springs Valley Electric Cooperative, Inc.
A Touchstone Energy® Cooperative

Sierra Vista & Willcox, Arizona

MOHAVE electric cooperative
A Touchstone Energy® Cooperative

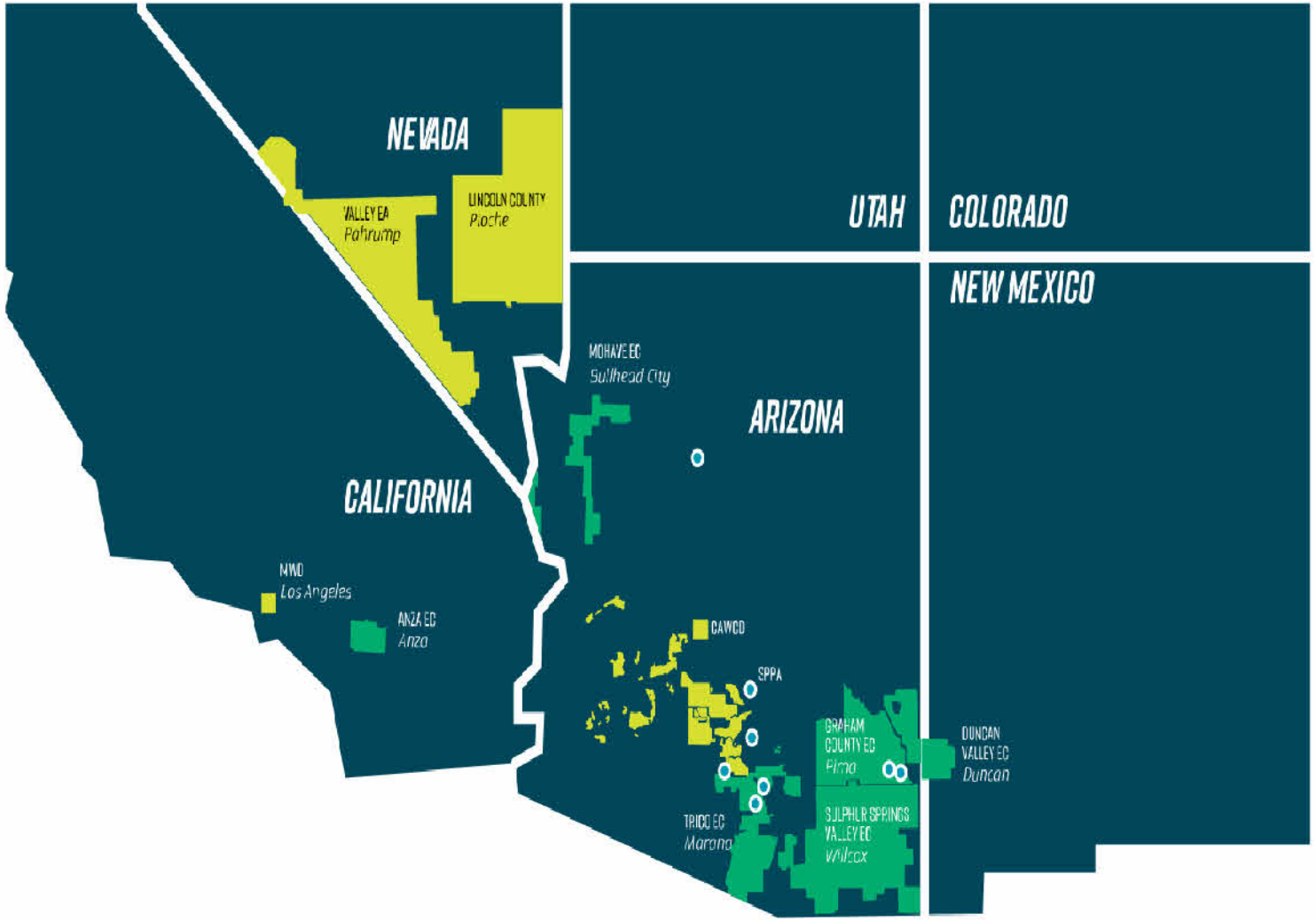
Bullhead City, Arizona

TRICO AN ENERGY COOPERATIVE

Marana, Arizona

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

AEPCO Member Cooperatives' Service Territories



- AEPCO Class A Members
- AEPCO Class D Energy Services Members
- Energy Services and Transmission Customers

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

COOPERATIVES ARE UNIQUE

- AEPCO provides wholesale G&T services with no retail customers
- Distribution cooperatives provide retail service
- Compared to other AZ regulated utilities:
  - Smaller
  - Geographically diverse
  - Rural communities
  - Not-for-profit and democratically governed
- Require flexible regulation

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

AEPCO Resource Portfolio

AEPCO Owned:

- Steam Unit 2 (ST2)
- Steam Unit 3 (ST3)
- Combined Cycle 1 (CC1)
- Gas Turbines (GT2, GT3, GT4)

AEPCO or Member Contracted:

- Hydro
- Apache Solar
- Long-term purchases
- Seasonal / month-ahead purchases
- Short term day-ahead / real-time purchases

AEPCO Owned/Contracted Resources* (Summer Net Available Capacity - MW)	
Apache Co-fire Coal / Gas Generation	175
Apache Natural Gas Generation	373
Hydroelectric Purchase Capacity	34
Other Power Purchase Agreements	13
Apache Solar	17
Total:	612 MW

*Excludes MW designated for losses and contingency reserves, as well as renewables located behind the transmission meter or contracted to an outside entity. Chart includes only resources and renewables owned or contracted by AEPCO that serve its distribution cooperative membership.

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Resource Procurement Update

New Flexible Gas Generation

- Signed contract with a vendor to develop 84 MW of quick-start, fast-ramping gas generation in Cochise County currently scheduled to be complete in mid to late 2024
- Developing a second site for additional capacity in Mohave County

All-Source RFP and Other Renewable Projects

- In final contract negotiations with the winning bidder to construct a large renewable project
- Evaluating the potential for IRA funding for this and other planned renewable / battery projects

Distributed Solar and Battery Projects

- Completed, or are on track to complete, 45 MW of new solar and 45 MW / 120 MWh of battery storage by summer 2023 (AEPCO Members)
- Experienced supply chain delays acquiring 55 MW / 160 MWh of battery storage pushing commercial operation past summer 2023 (AEPCO and AEPCO Members)

Demand Response

- Completed implementation of a software solution to enable Members to offer a smart thermostat program
- Piloting with Graham County Electric Cooperative this summer with potential to expand to other Members and device types in the future

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

Resource Providers' Services – Summer 2023

AEPCO has secured sufficient resources to meet the coincident peak demand for its All Requirements and Partial Requirements Members.

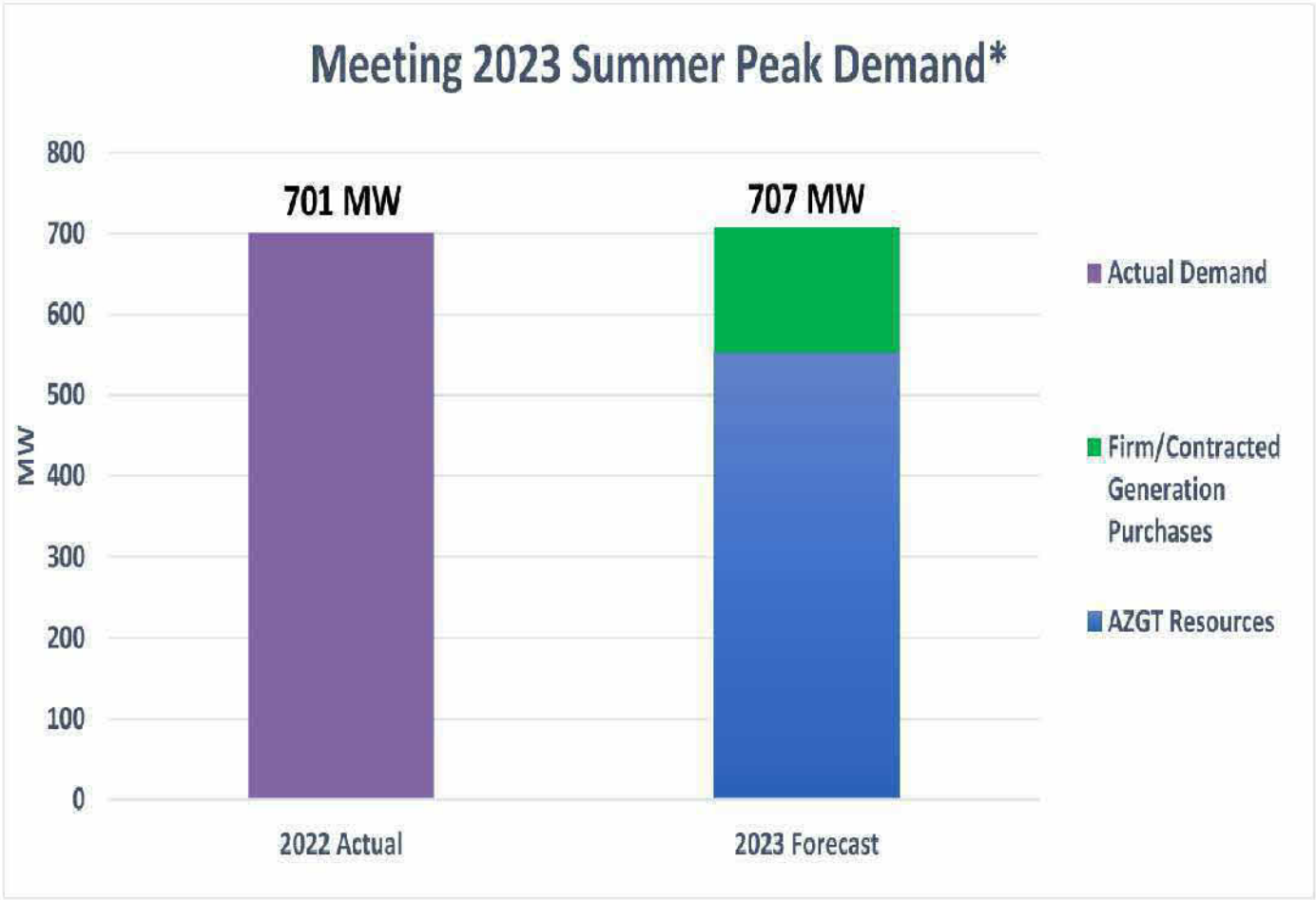
- ARMs receive all resource-related scheduling, trading and ancillary services under their All Requirements contracts
- PRMs need to contract for services in excess of their PRM agreements from AEPCO or third-party providers
  - All PRMs are in the AEPCO metered subsystem of the Western Area Power Administration Desert Southwest (WAPA DSW) Balancing Authority Area with AEPCO as their Scheduling & Trading Agent.
  - PRMs supplement their share in AEPCO resources in order to satisfy their summer peak load requirements. Additional resources and firm purchased power transactions are scheduled to fully meet PRM peak load requirements.

Navopache receives all necessary resource-related services from Tucson Electric Power (TEP) and is in the TEP Balancing Area.

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

2023 Projected Peak Load & Resources



Navopache's projected summer peak load of 94 MW will be met by its 8 MW of federal hydroelectric capacity and the balance will be supplied by TEP as firm energy from TEP.

*Represents possible capacity mix for peak load service under normal operating conditions while maintaining operating reserves. Reported demand is as seen by AEPCO and is net of distribution cooperative solar, which is behind the transmission meter.

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

AEPCO Reliability & Readiness

- Diverse mix of generation, transmission, partnerships:
  - Member of the Southwest Reserve Sharing Group (SRSG)
  - Generation capacity used for operating reserves
  - Transmission capacity to cover the largest contingency
  - Strategic partnerships for emergency or temporary generation in case of unplanned generation outages
- Fuel diversity in generation portfolio
- Preventative maintenance and weatherization
- Reliability standard compliance
- Emergency-only repairs on critical assets during summer

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Apache Station Fuel Supply

Natural Gas

- Interconnected with El Paso Natural Gas pipeline
- Contract with EPNG for firm gas transportation
  - Hourly and daily
- Support additional gas infrastructure in the state

Coal

- On-site inventory of fuel supply
- Coal supply and rail transportation contracts

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

AEPCO Generation Preparedness

Regular Unit Maintenance & Testing

- Large steam units have a regular maintenance cycle of both major and minor overhauls and are monitored on an ongoing basis for any operational irregularity.
- Peaking gas units have been recently tested to ensure startup capability and readiness for operational and reserve obligations.

Major Maintenance Activities

- In Fall of 2022, Apache GT4 completed a borescope inspection, and subsequent repairs are scheduled to be completed before summer.
- In Fall of 2022, Apache Steam Unit 3 had scheduled maintenance in preparation for the winter peak season.
- In Spring of 2023, conducting a major overhaul on Apache Steam Unit 3 and maintenance on other units in preparation for summer.

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

AEPCO Transmission System Summer Preparation

Transmission and substation maintenance and assessment activities include:

- Preventative substation maintenance performed prior to summer season
- Focused power line inspection and vegetation management activities
- Partnership amongst cooperatives and other utilities

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

AEPCO Operational Preparedness

- AEPCO works with other utilities on seasonal planning studies and outage coordination to ensure the system is prepared for various contingencies.
- In addition to annual black-start training and tests of backup control infrastructure, AEPCO submits emergency operating plans to its Reliability Coordinator (RC), working with neighboring Balancing Authority Area entities.

Readiness Exercises

- Bi-weekly reliability calls with neighboring BA and regular calls with our Host BA during high load or events that may require operational coordination
- Host an annual exercise with distribution cooperatives before summer to improve coordination during system emergencies
- Monitor and track wildfires within a specified area of AEPCO elements, specifically between May and September or as needed for rest of the year

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Energy Imbalance Market (EIM)

- AEPCO went live in the CAISO EIM on April 5, 2023
- Participation in EIM increases opportunities for economic trading value through the organized, intra-hour market
- EIM balancing authorities must bring balanced loads and resources to participate each hour
  - Cannot plan to be short and "lean" on the market for reliability
  - Similarly cannot have too much non-dispatchable generation and plan to "dump" energy on the market
- Developed business processes with the Balancing Authority to ensure resource sufficiency to participate in each hour
- Continuing to explore expanded western market options

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

2023 – 2026 Risks

Risk	Mitigation
Demand Forecast Uncertainty	➢ Increase coordination of Member/AEPCO resources and DER dispatch at peak ➢ Support Member Demand Response programs to reduce demand during peak times
New Resource Development Risk • Supply Chain/Labor Availability • Permitting and Siting • Regulatory Approvals • Lead Time for RFPs and Studies	➢ Build and procure resources in advance of immediate need ➢ Diversify sites and projects to reduce impact if single site or technology has timing or feasibility setbacks ➢ Pursue projects benefitting our Member communities ➢ Maintain lines of communication with regulatory bodies ➢ Seek out partnerships to coordinate resources and make resource procurement more efficient
Reduced Physical Power Market Liquidity	➢ Maintain existing generating units for maximum reliability ➢ Invest in flexible new resources ➢ Optimize transmission portfolio for access to diverse hubs
Gas Price Volatility	➢ Continue to support Members' gas-price hedging programs ➢ Invest in fixed-price renewable and storage projects ➢ Maintain fuel diversity in portfolio with coal, hydro, solar and modernize gas fleet with more efficient, flexible alternatives

Long-Term Risks

Ability to Meet Seasonal Peak Demands

- Load uncertainty
  - Extreme weather
  - Economic growth
  - Electrification
- Declining marginal effective capacity of solar and batteries
- Battery capacity degradation over time
- Hydro reductions
- Aging fleet outages
- Environmental regulations
- Fuel delivery interruptions and constraints

Price Management and Certainty

- Gas price volatility
- Lithium price volatility affecting batteries
- Solar saturation curtailments
- Resource capital cost uncertainty over time
- Tax credit uncertainty

Ability to Meet Daily Demand

- Lower capacity factor, non-dispatchable wind and solar (energy adequacy)
- More variability and steep ramps to integrate solar, wind
- Lack of regional weather diversity
- Hydro reductions
- Aging fleet outages
- Environmental regulations
- Fuel delivery issues

Resource Development

- Supply chain
- Permitting and siting
- Regulatory approvals
- Transmission infrastructure for interconnections
- Carbon reduction regulations
- Maturity of available technologies
- Stranded assets

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Summary of 2023 Summer Preparedness

- Existing resources, supplemented by firm purchases, will be sufficient to meet forecasted demand and energy needs.
- Fuel supply and transmission are in place to meet AEPCO's peak obligation.
- Operationally, AEPCO is well prepared with contingency plans and adequate reserves are in place for emergencies.
- Transmission system is well maintained and ready to serve the load of AEPCO's Members and customers.
- Beyond 2023, AEPCO will continue developing and investigating new resources to manage cost and ensure continued reliability.

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Questions?

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

ATTACHMENT

TRANSWESTERN PIPELINE COMPANY
(TRANSWESTERN)

APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS WORKSHOP

PRESENTATION

TRANSWESTERN PIPELINE COMPANY

AN ENERGY TRANSFER COMPANY

SUMMER PREPAREDNESS UPDATE

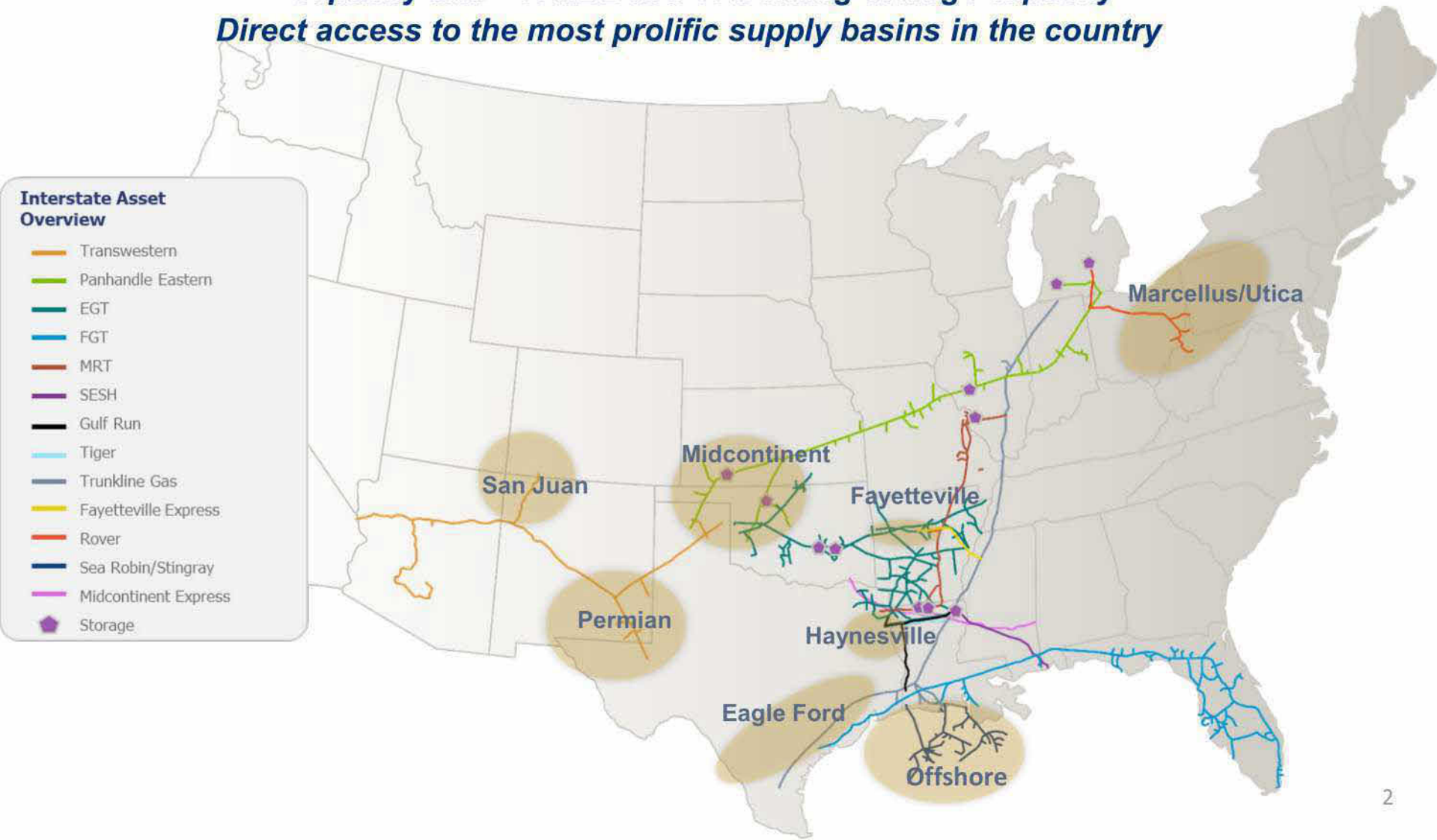
ARIZONA CORPORATION COMMISSION

April 24, 2023

ENERGY TRANSFER
INTERSTATE NATURAL GAS PIPELINES

~27,030 miles of interstate pipelines with ~32.3 Bcf/d of throughput capacity and ~164.2 Bcf/d of working storage capacity

Direct access to the most prolific supply basins in the country



TRANSWESTERN PIPELINE SYSTEM OVERVIEW

The system consists of approximately 2,600 miles of large diameter pipeline

- ~ 2.1 Bcf/d delivery capacity
- ~ Multiple supply basins
- ~ Bi-directional Capability
- ~ 250 interconnects

Markets Served:

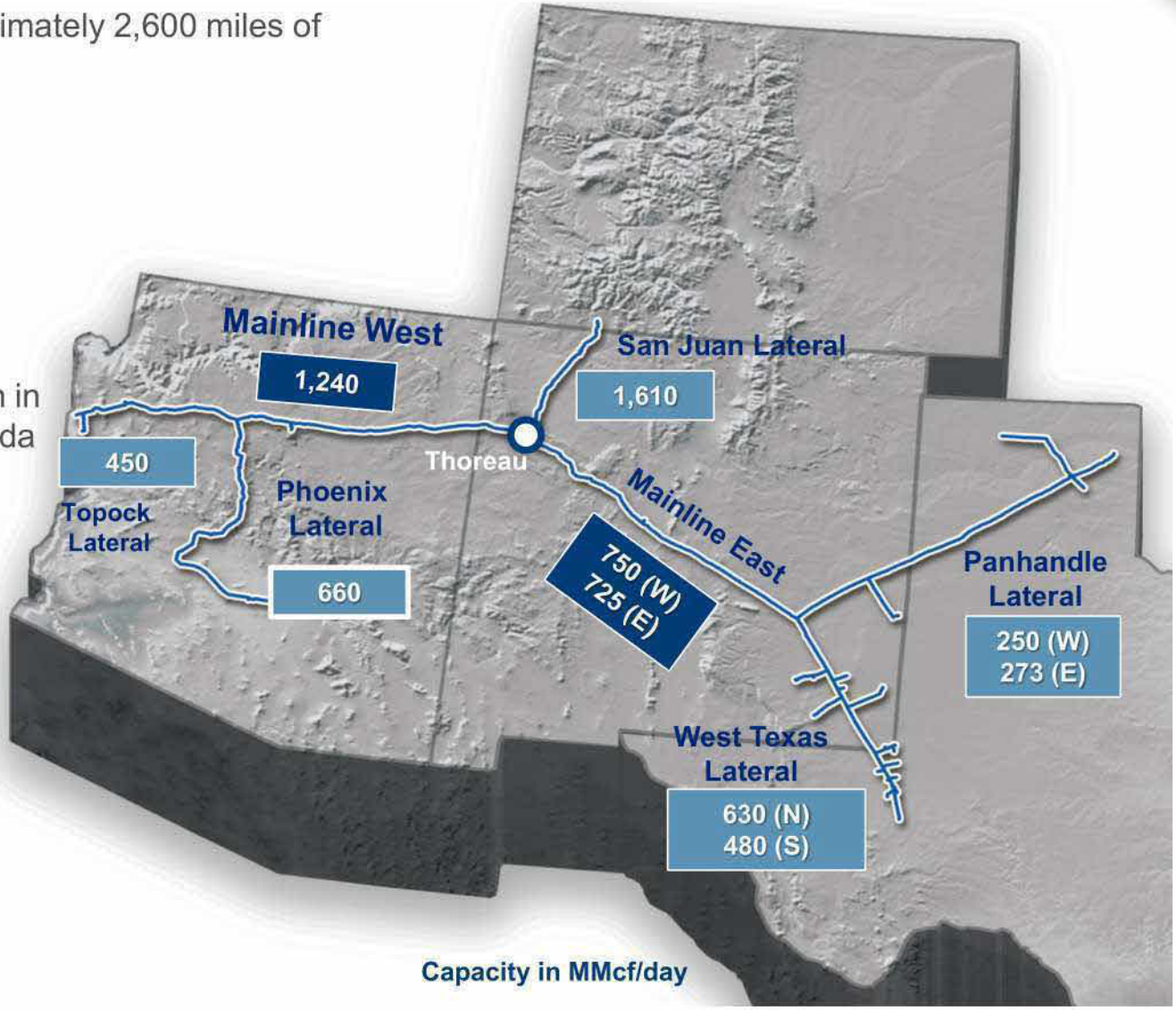
- LDCs and power generation in New Mexico, Arizona, Nevada and California

Major Customers:

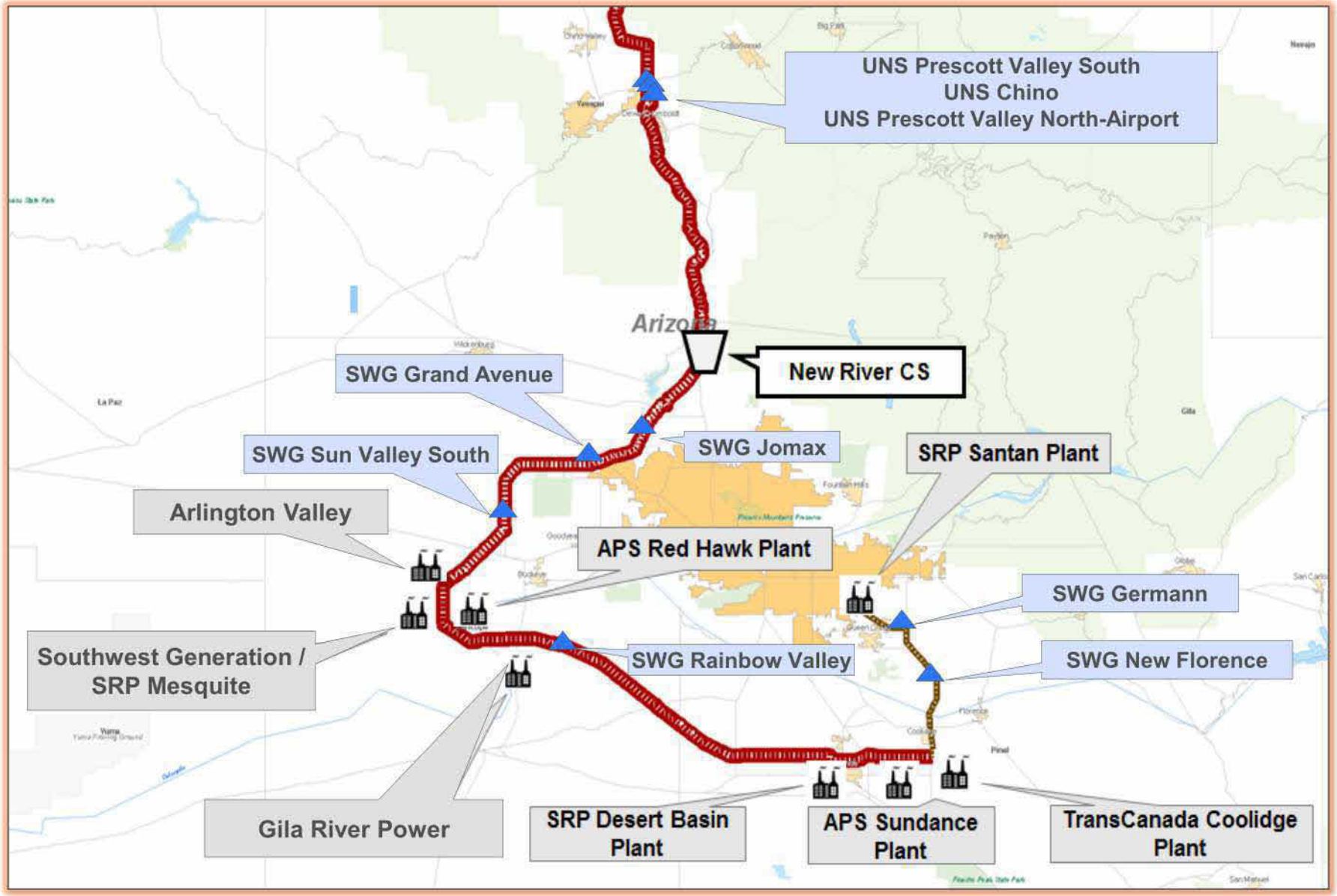
- Salt River Project
- Arizona Public Service
- Southwest Gas Company
- SoCal Gas
- New Mexico Gas Company

Supply sources:

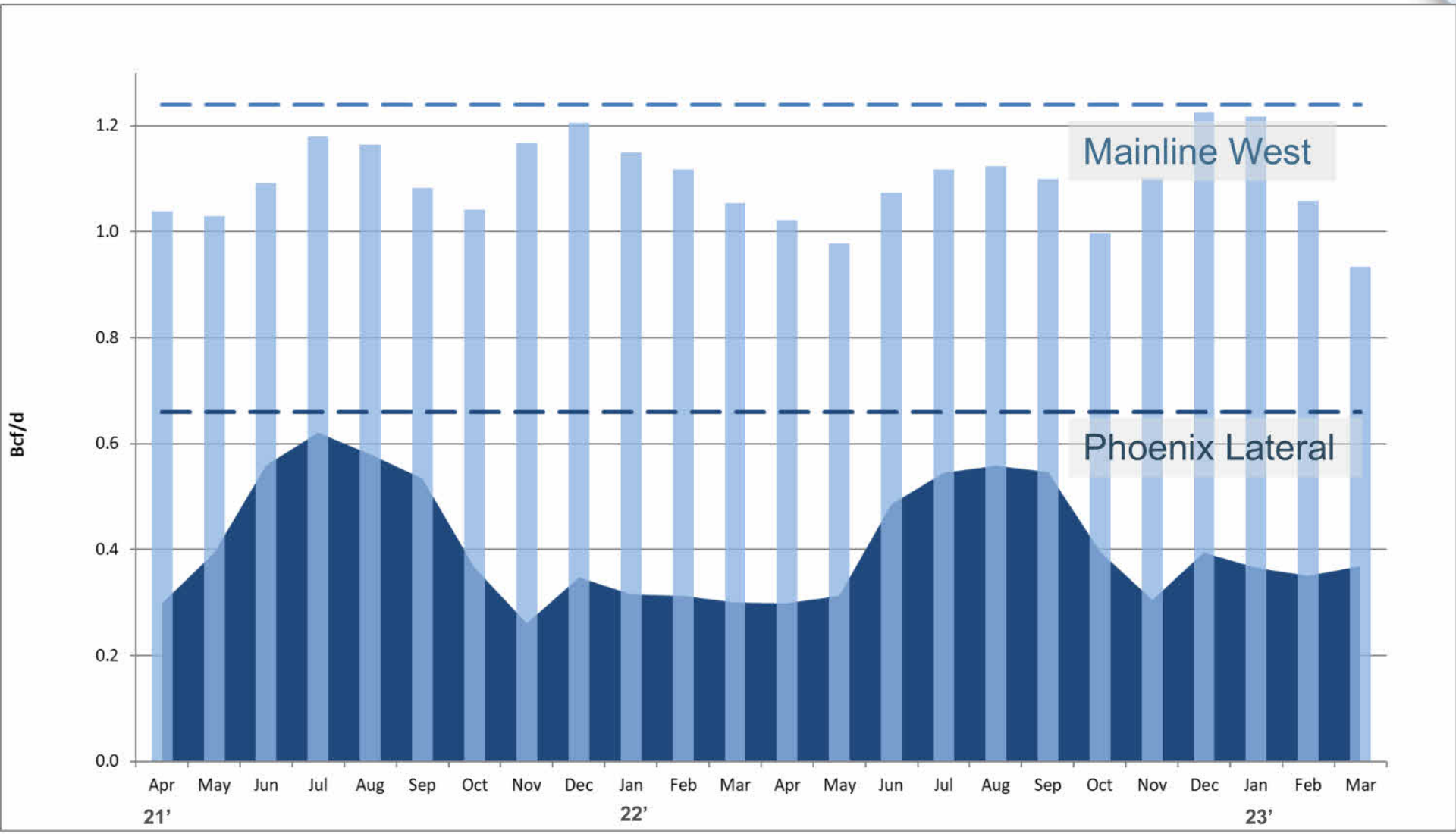
- San Juan
- Permian
- Midcontinent
- Rockies



TRANSWESTERN'S PHOENIX LATERAL



WEST MAINLINE AND PHOENIX DELIVERIES



SPRING 2023 MAINTENANCE

- Phoenix Lateral
  - Routine meter station maintenance (Completed March 2023, coordinated with customers)
  - Pipeline Cleaning Pig Runs (Planned, coordinated with customers)
  - New River Compressor Maintenance (Planned)
- West Mainline
  - CS 1, 3 Semi-annual Maintenance (Completed March 2023)
  - CS 4, Semi-annual Maintenance (Completed April 2023)
  - CS 2, Semi-annual Maintenance (Planned May 2023)
- East Mainline
  - Station 8 Maintenance (In Progress April/May 2023)
  - Station 9 Maintenance (Planned May 2023)
- San Juan Lateral
  - Bloomfield CS Annual Maintenance (Planned May 2023)
  - La Plata CS Maintenance (Planned June 2023)

SUMMER 2023 PREPARATIONS

- Local and Offsite Business Continuity Plan (BCP) Facilities will be tested and ready for Summer.
  - Local facility currently utilized
  - Offsite facility test planned

- BCP Facility staffing
  - Gas Control
  - Scheduling & Contracts
  - Gas control support staff

- **EBB Notifications -- http://twtransfer.energytransfer.com**

- **Critical Notices posted and emailed to both operators and shippers**

TRANSWESTERN PIPELINE COMPANY CONTACTS

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ATTACHMENT

EL PASO NATURAL GAS PIPELINE
(EPNG)

APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS WORKSHOP

PRESENTATION

KINDER MORGAN

Delivering Energy to Improve Lives

El Paso Natural Gas Pipeline 2023 Summer Preparedness

Presentation to the Arizona Corporation Commission
April 24, 2023

Russ Pyeatt
Manager, Gas Control
(EPNG/Mojave/Sierrita)

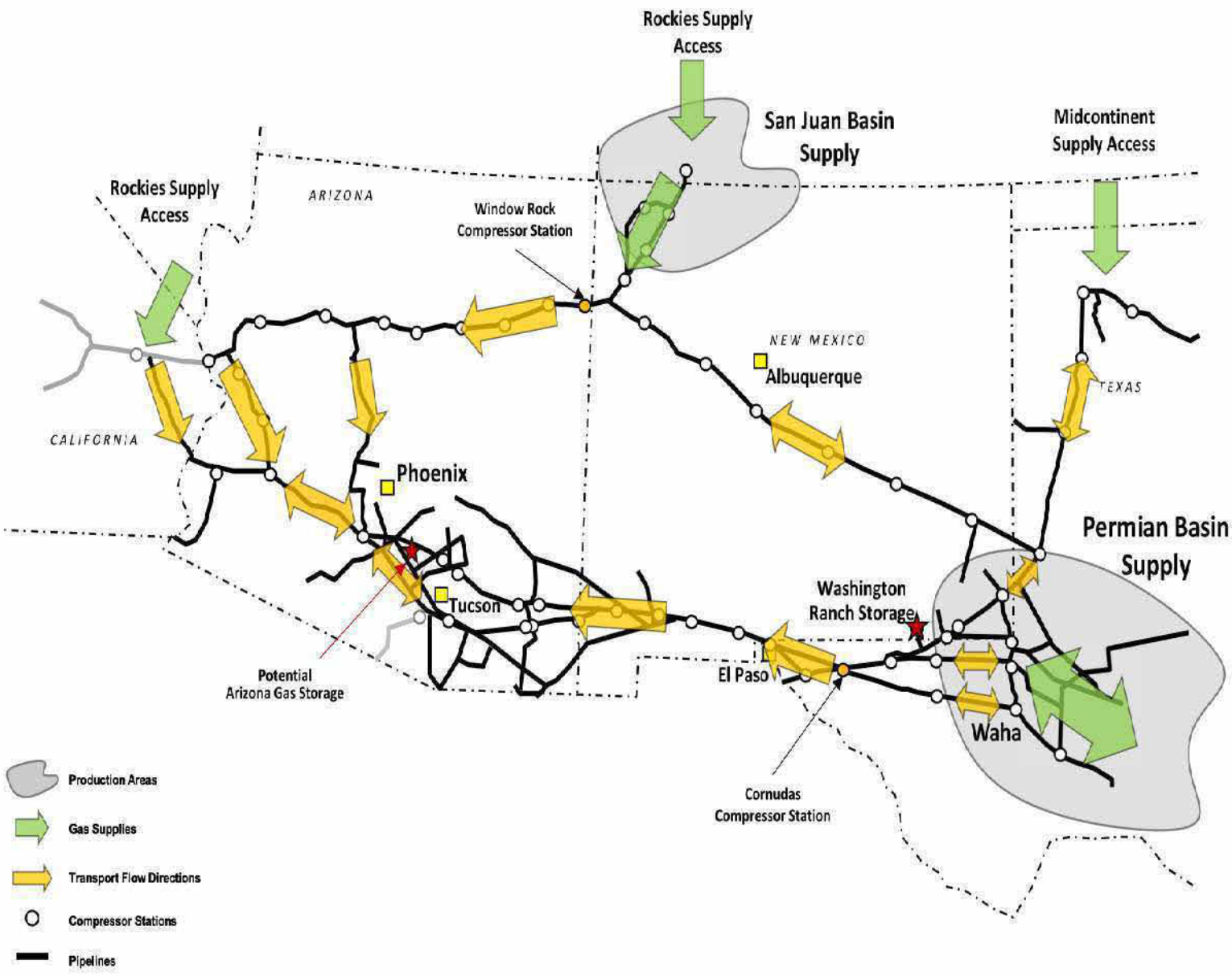
KINDER MORGAN

Operations Overview

EPNG System Overview

Supply Locations and Flow Direction

KINDER MORGAN



El Paso Natural Gas (EPNG) is a pipeline system which transports natural gas from the San Juan, Permian and Anadarko basins to California, Arizona, Nevada, New Mexico, Oklahoma, Texas and Northern Mexico. EPNG also owns approximately 44 billion cubic feet of underground working natural gas storage capacity in Southeast New Mexico. Winter Design Capacity: **4,883 MMcf/d.**

CONSTRAINT	DESIGN CAPACITY [MMcf/d]
Cornudas	2,535
Window Rock	2,348

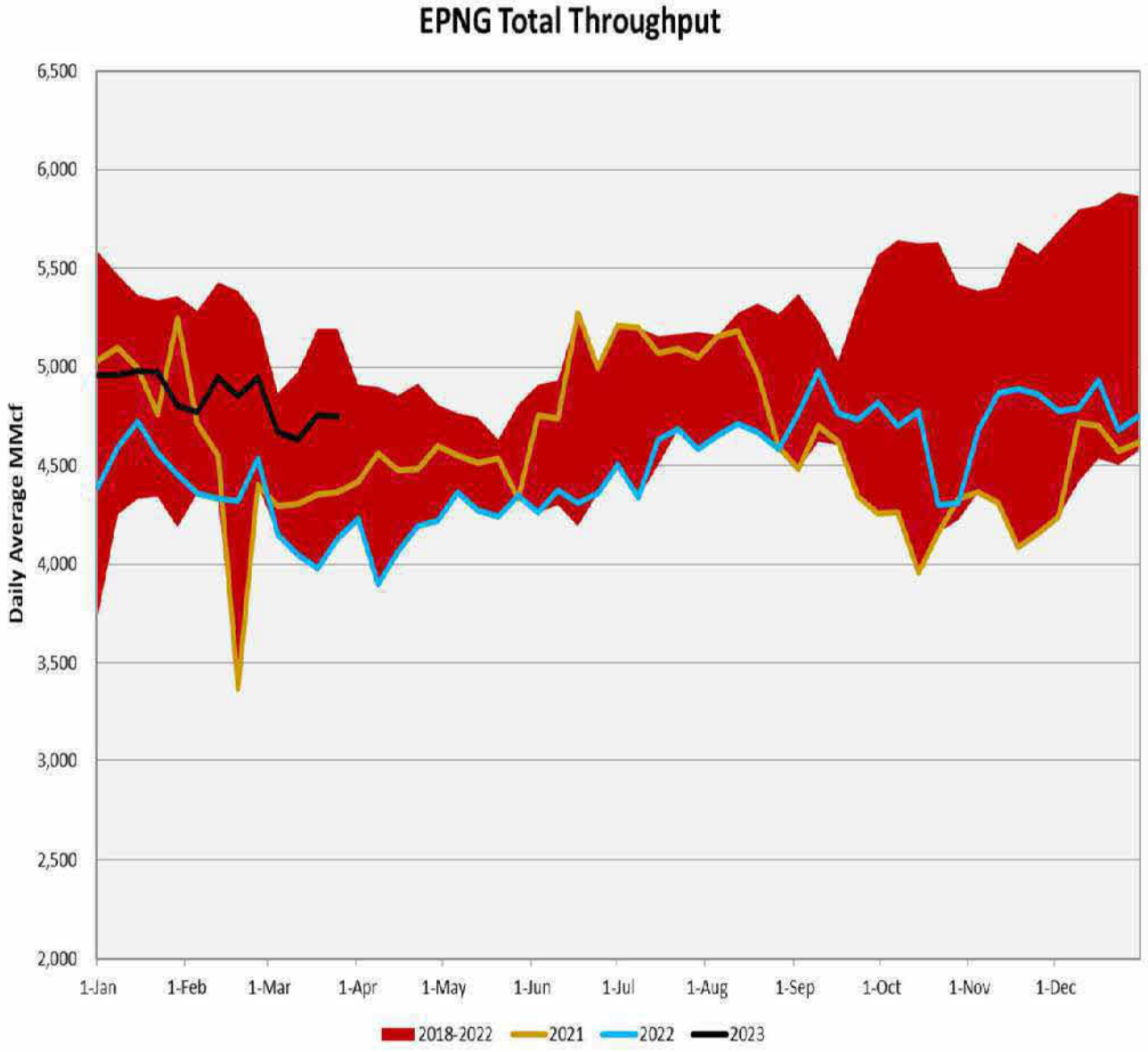
The **Mojave Pipeline** is a pipeline system that connects with the EPNG system near Topock, Arizona, Cadiz, California, the Transwestern systems in Arizona, and Kern River Gas Transmission Company in California.

The **Sierrita Gas Pipeline (Sierrita)** is a pipeline system that extends from the El Paso Natural Gas pipeline system, near Tucson, Arizona, to the United States-Mexico border near Sasabe, Arizona.

EPNG Total System

2018-2023 Throughput Trends (MMcf/d)

KINDER MORGAN



San Juan Basin

2018-2023 Throughput Trends (MMcf/d)

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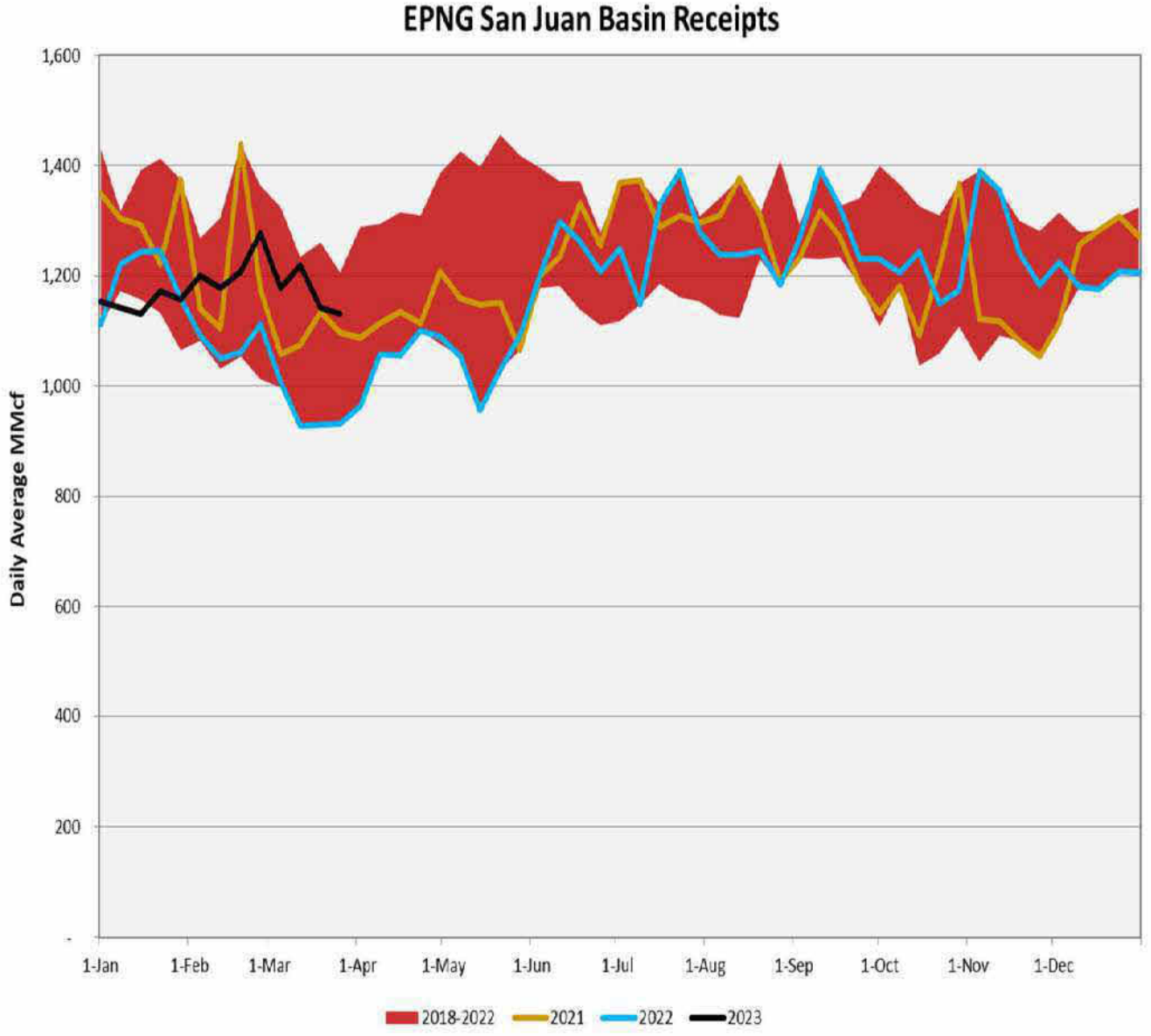

North Mainline

2018-2023 Throughput Trends (MMcf/d)

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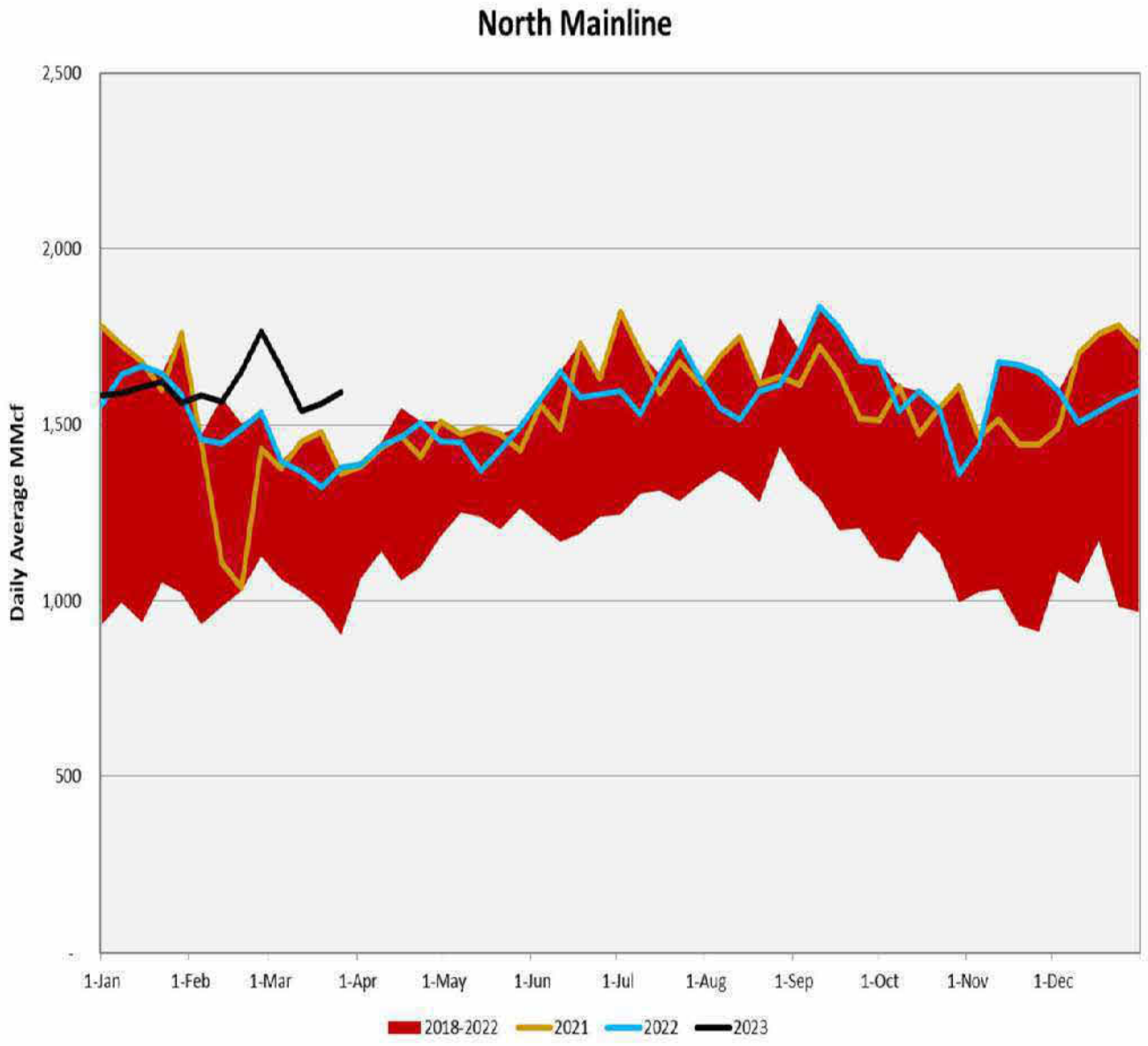

Permian Basin

2018-2023 Throughput Trends (MMcf/d)

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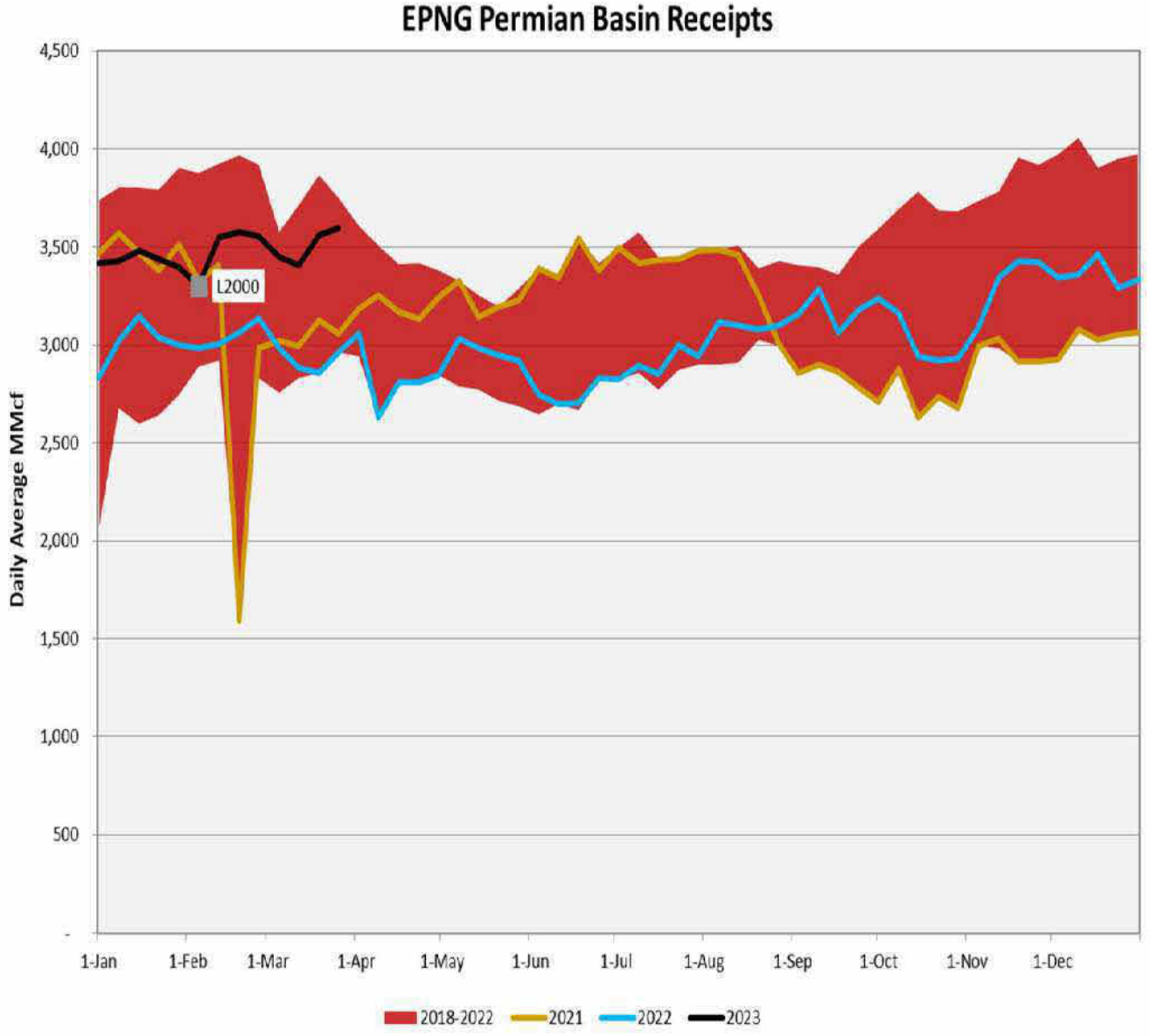

South Mainline

2018-2023 Throughput Trends (MMcf/d)

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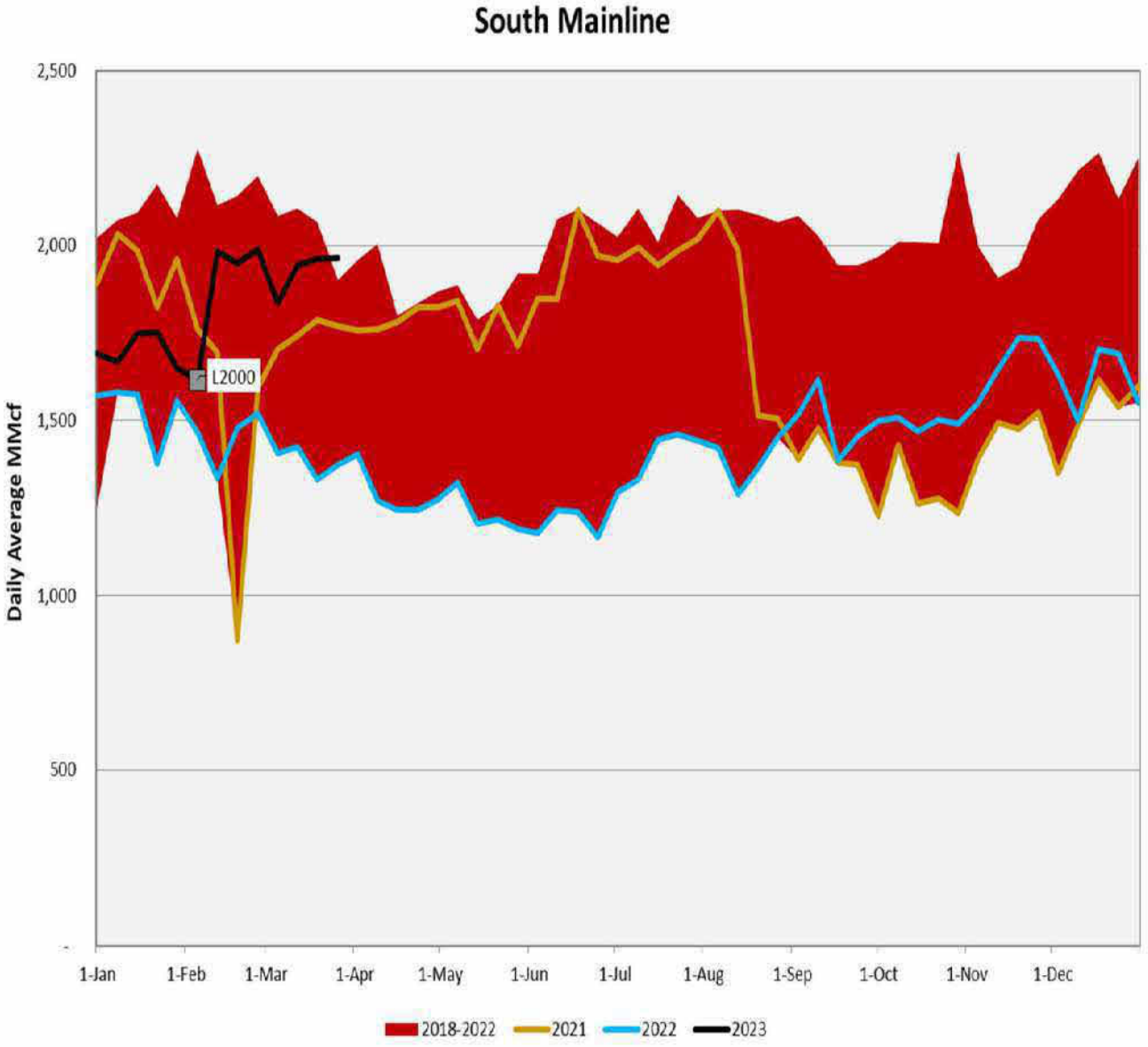


KINDER MORGAN

Summer Preparedness

Summer Preparedness

KINDER MORGAN

- Maintenance Planning
  - Schedule maintenance with a focus on minimizing impacts to available capacity.
  - Combine multiple maintenance activities, when possible, to minimize number of outages (days or volumes).
  - Coordinate customer-specific work with the customer.
- Communication and Coordination
  - Shipper and Stakeholder Mass Communication via EBB notices and text messages.
  - Shipper-Specific Communications.
  - Communication Protocols with ERCOT, RC West, and California ISO (CAISO).
- Operational Response
  - Multiple flow paths for supply to reach the market.
  - Access to supply area storage: Washington Ranch, Keystone Gas Storage and Merchant Ranch Storage.

- EPNG has developed excellent working relationships with both affiliated and non-affiliated interconnecting pipelines which provide additional layers of contingency management in responding to emergency situations.

KINDER MORGAN

Thank You

ATTACHMENT

SOUTHWEST GAS CORPORATION
(SWG)

APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS WORKSHOP

PRESENTATION

Arizona Summer Preparedness

April 24, 2023

Company mission

To enrich the lives of customers and employees within our Southwest communities by providing safe and reliable natural gas service.

Presentation Overview

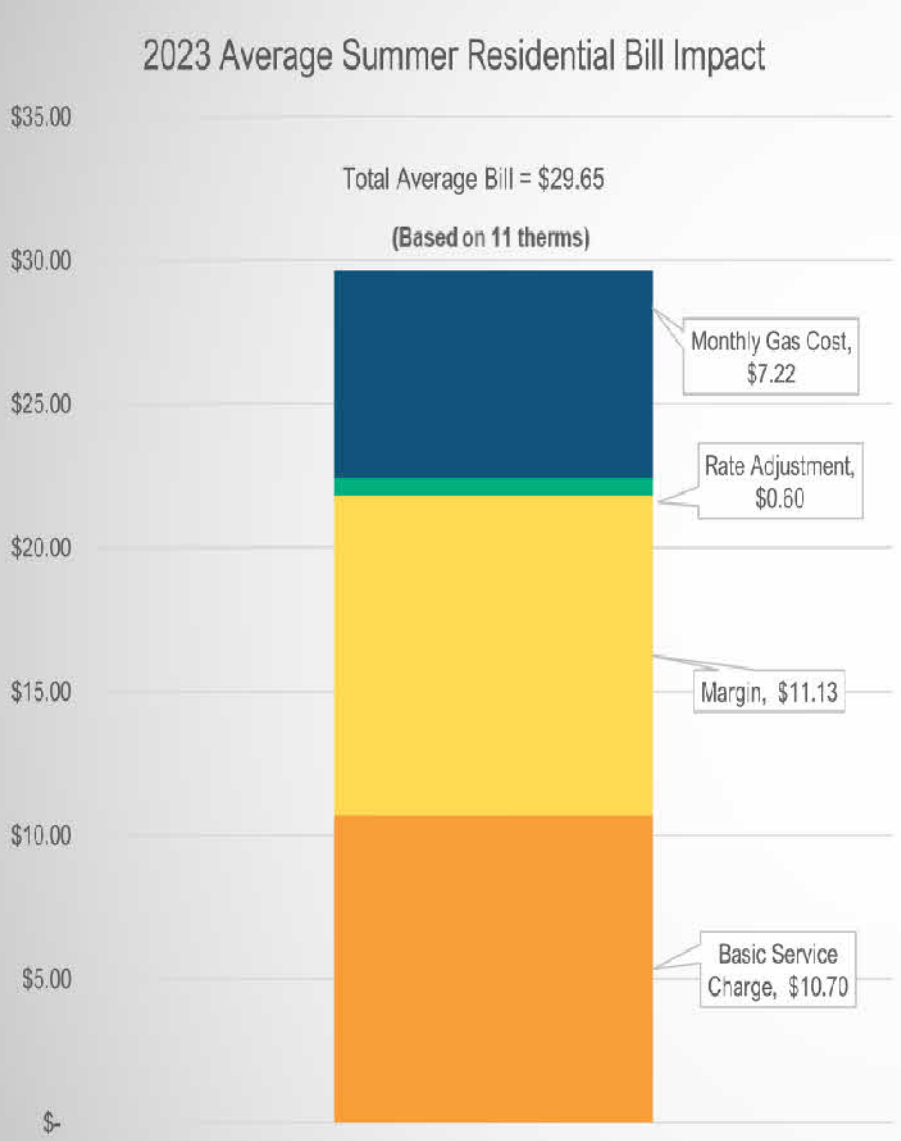
Residential Customer Bills

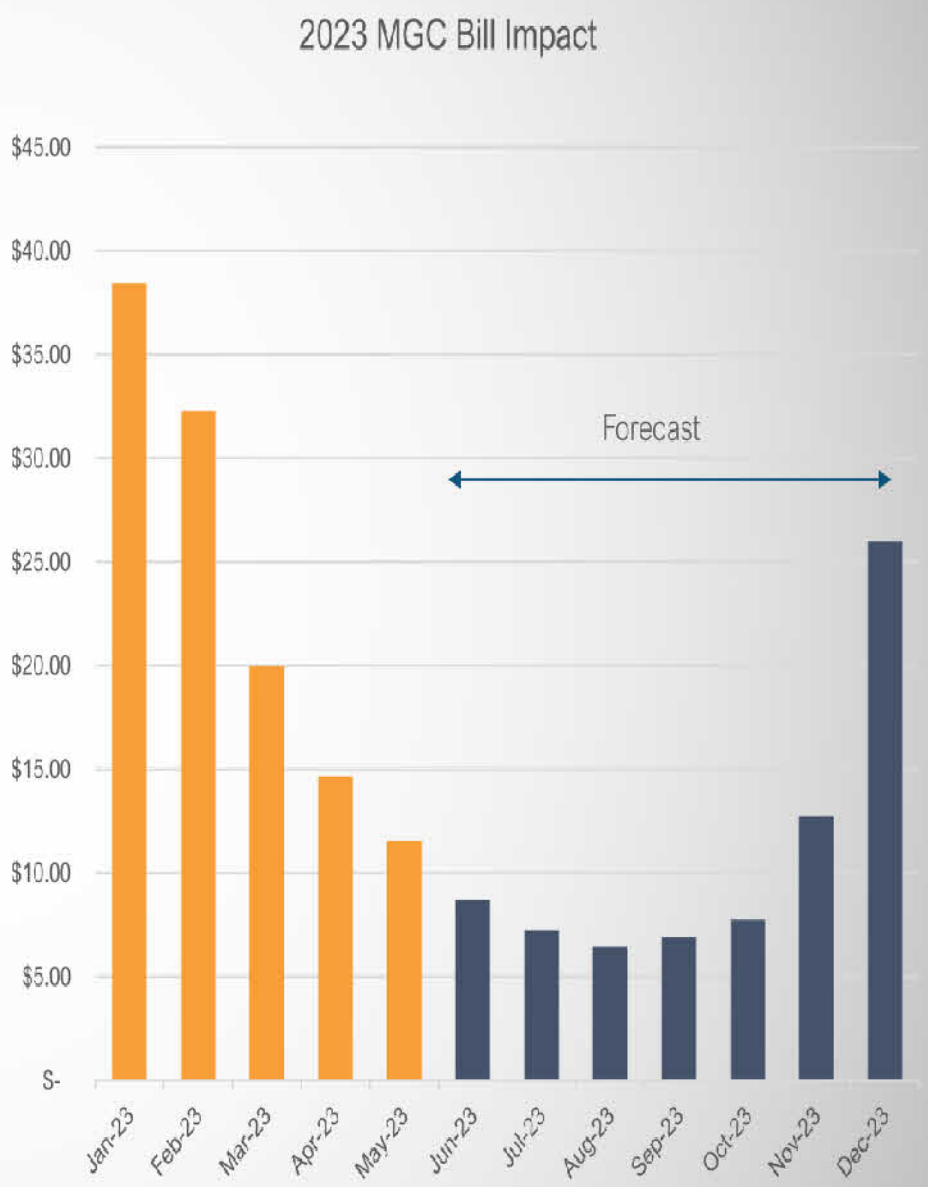
Utility Operations

Natural Gas Market Update

SOUTHWEST GAS

Residential Customer Bills





Southern Arizona Operations Update

Graham County

- 8th Street & 1st Avenue – Thatcher
  - 14,298' 1960 steel replacement with 2" and 4" PVC main & service
  - Replacement of M. Lee regulator station

Bowie, Az

- Replacement of 2,562' of 1954 steel with 2" high pressure steel

Central Arizona Operations Update

TSMC

- New "CL" system and improved "DH" system completed to serve TSMC and Air Liquide
- 2 new city gates; 2 city gate upgrades
- 18 miles of high pressure steel pipe

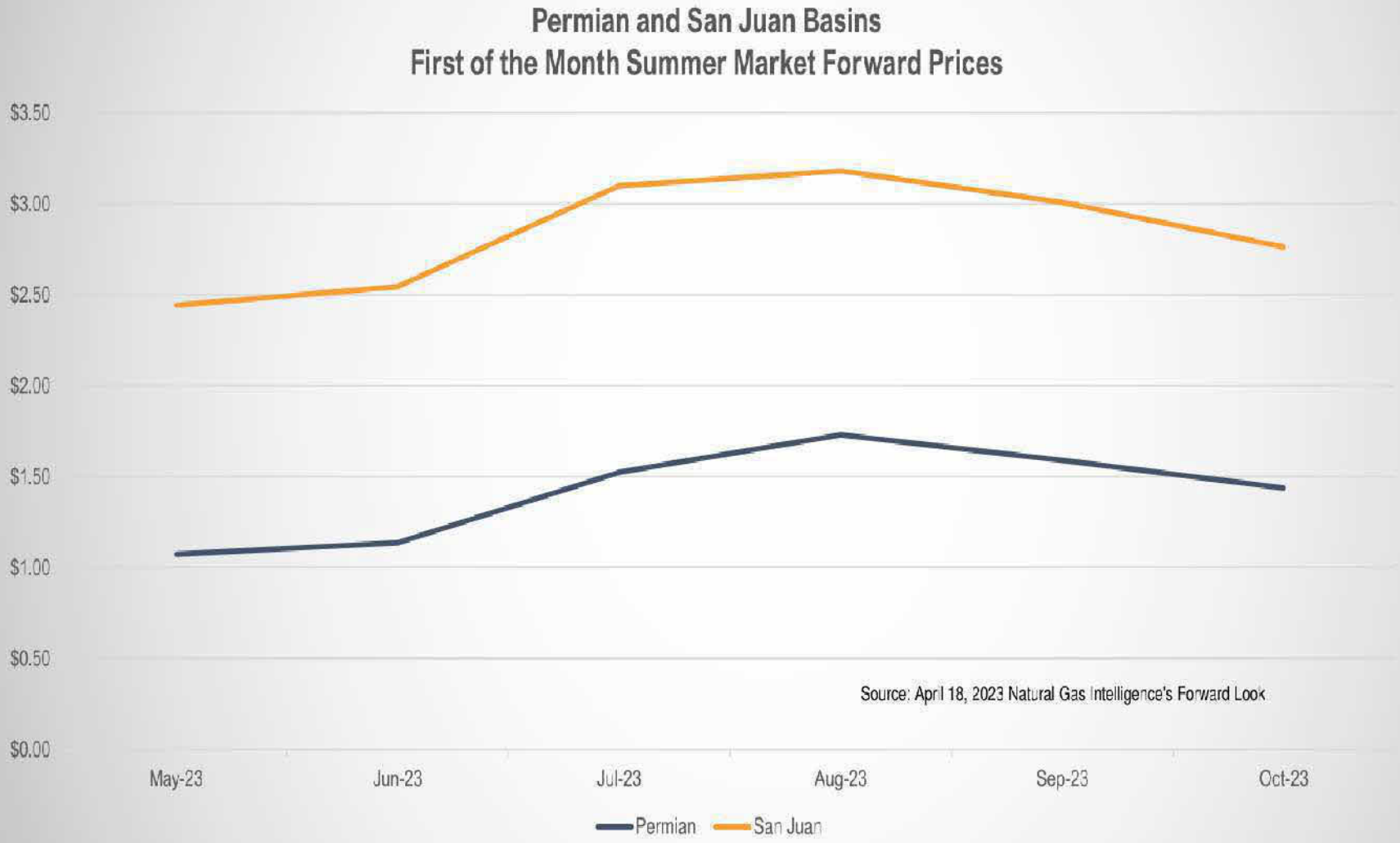
West Valley

- 9 miles of new 12" main on Litchfield Road from Waddell to Thomas to serve new industrial and commercial customers
- 2 miles of 12" main on Olive Avenue between Cotton Lane and Reems Road for upcoming heating season

Phoenix

- 1.5 miles of 8" main on 12th Street from Maryland Ave to Camelback to reinforce the "K Feeder" system

Natural Gas Market Update




Thank you

ATTACHMENT

UNS GAS, INC.
(UNS GAS)

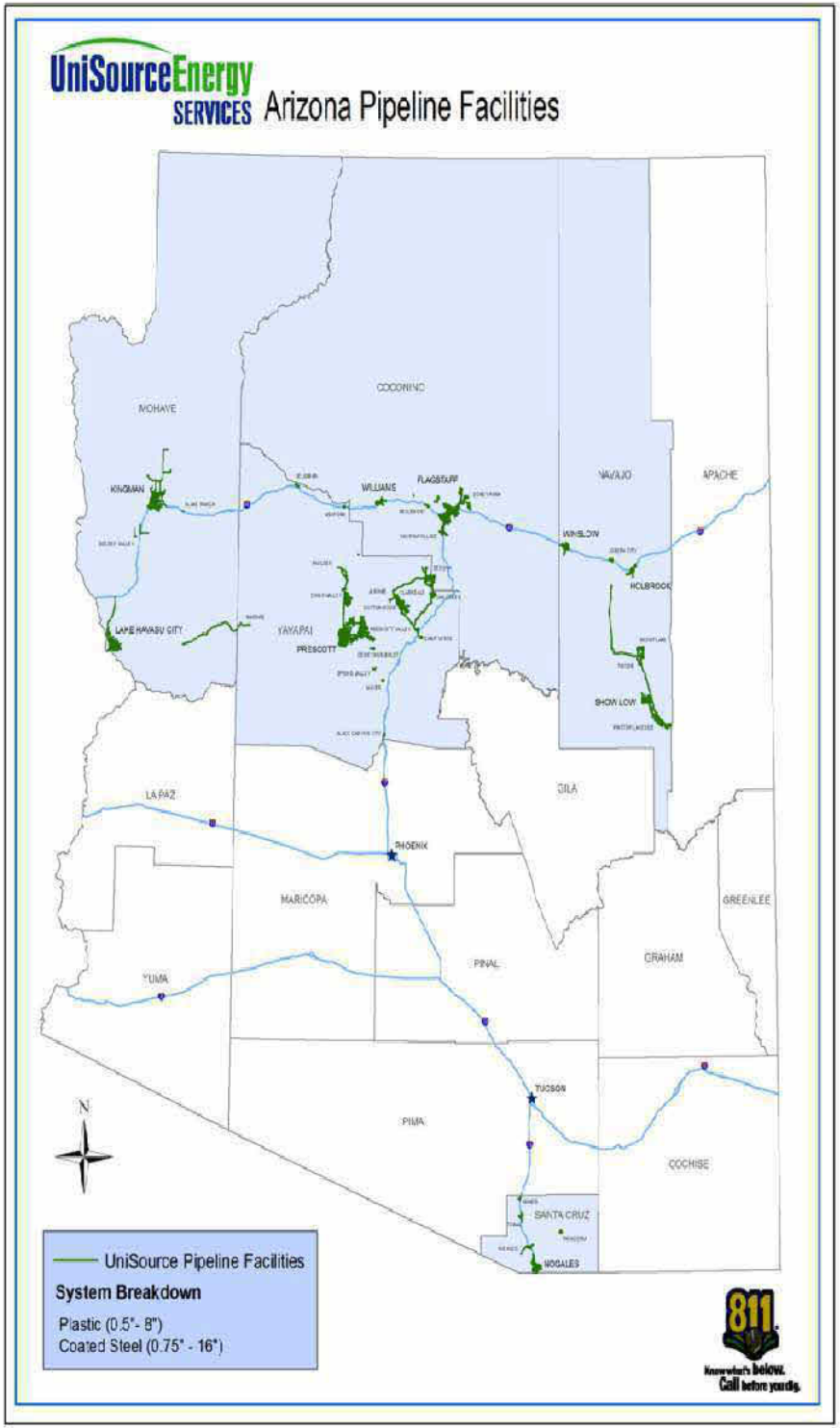
APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS WORKSHOP

PRESENTATION

UNS Gas 2023 Summer Preparedness

Martin Anaya
Director UES Gas

UniSourceEnergy SERVICES



- 39 Communities
- 5 Counties
- 167,000 Customers
- 179 Employees
- 4,790 miles pipeline
- 7 Operations Centers
- 1 Field Training Facility

Our Culture Makes Us Great

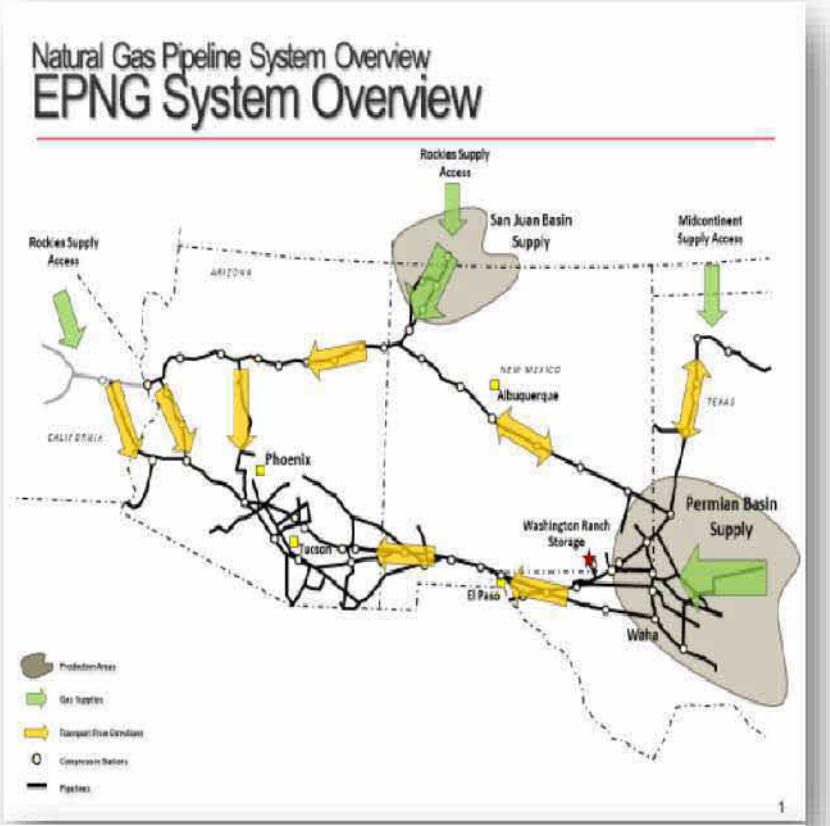
UniSourceEnergy SERVICES

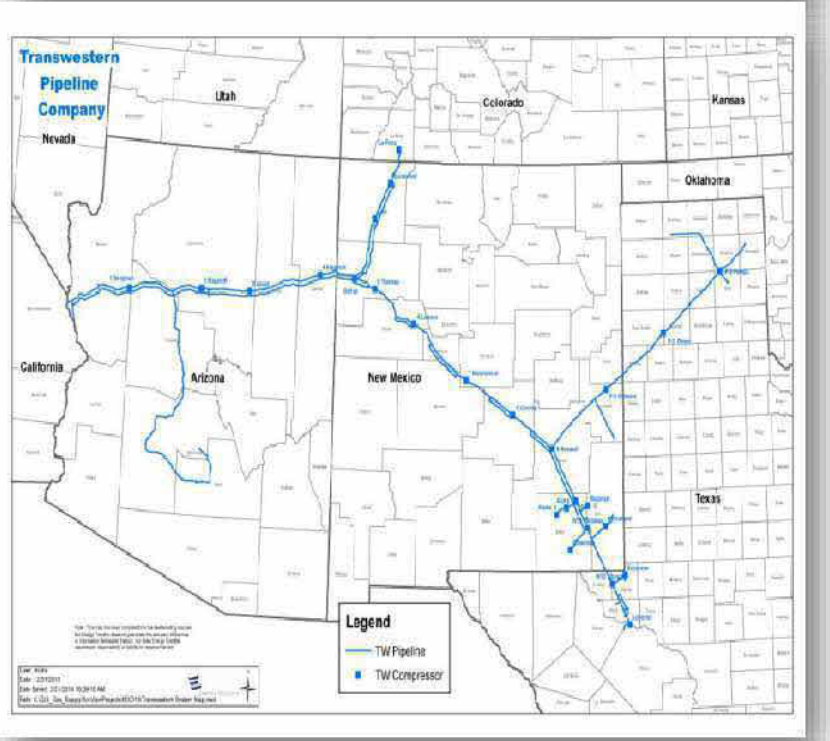
Our Culture!

Safety
- Trained Employees
- Customer Safety
- Pipeline Safety

Community
- Philanthropic
- Highly Engaged

Supply Sources





Dual Interstate Pipeline Supply

- Kinder Morgan a.k.a. El Paso Natural Gas Pipeline
- Transwestern Pipeline
- Quarterly Meetings

UniSourceEnergy SERVICES

Post Winter Assessment

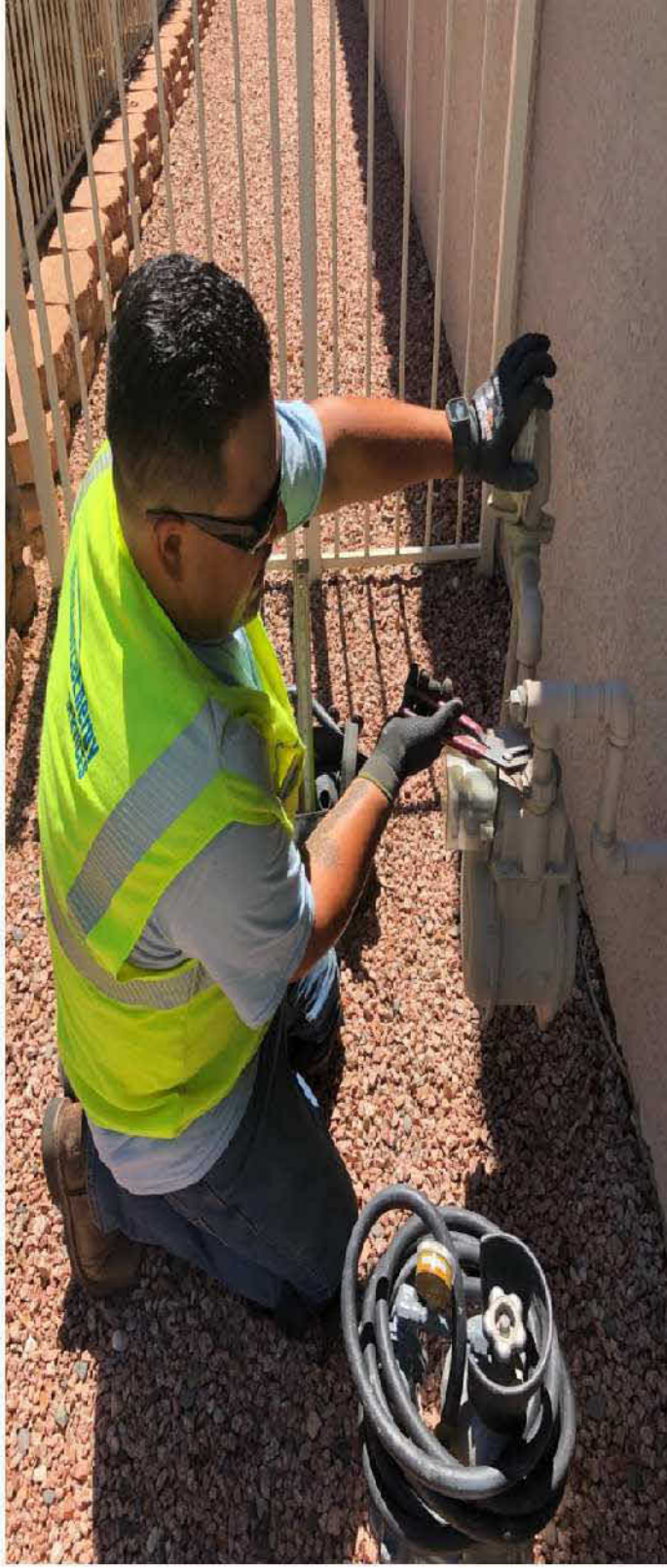
UniSourceEnergy SERVICES

Evaluation of System Performance

All Systems Performed as Designed

Historic Snowfall

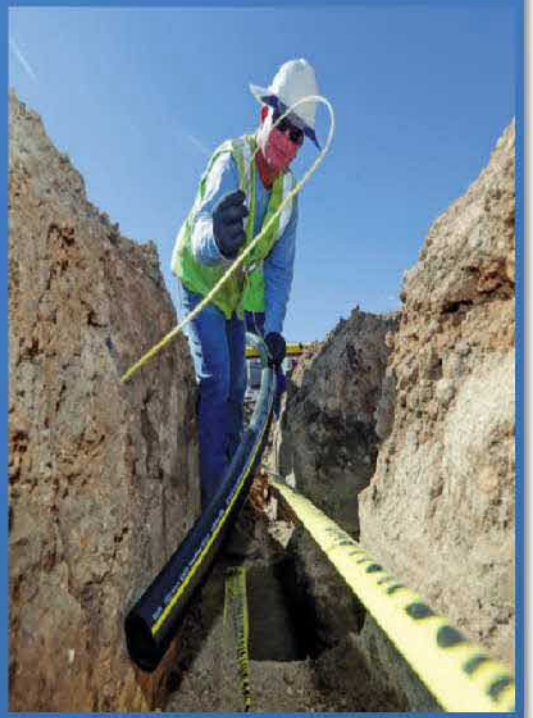
No Reported System Failures



Summer Outlook

- System Improvements
- Supply Chain
- Pipeline Safety
- Maintenance
- Public Improvements

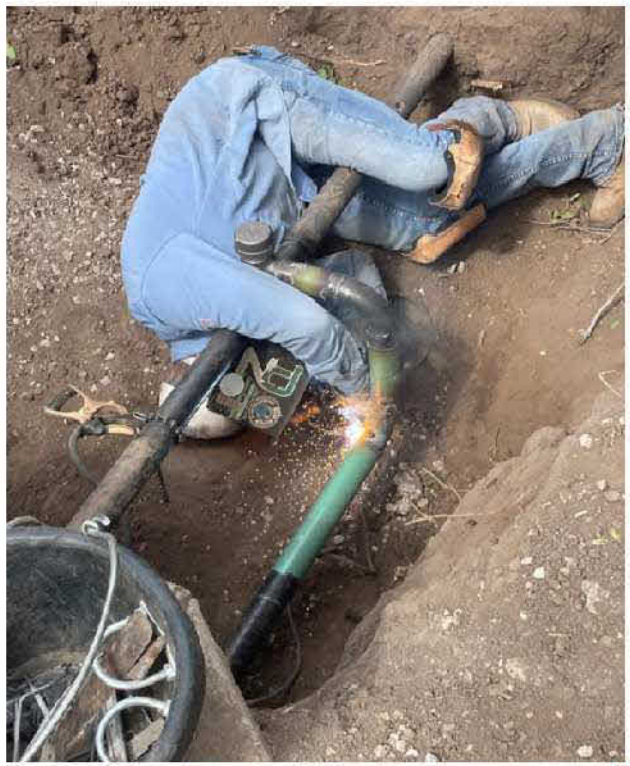
UniSourceEnergy SERVICES



Growth

2022 Facilities Installed YTD

- Services installed = 2,225
- Footage of Mains Installed = 81,100'
- Meters Set = 2,083



UniSourceEnergy SERVICES

Wildfire Preparedness

- Training
- Stakeholders
- Pipeline Safety
- Emergency Plans
- Community
- Statewide Response

UniSourceEnergy SERVICES

Post Wildfire Management

UniSourceEnergy SERVICES

- Training
- Stakeholders
- Pipeline Safety
- Emergency Plans
- Community

Seasonal Preparations

UniSourceEnergy SERVICES

- System Analysis
- Outage Analysis and Notification Preparedness
- Geographic Information System (GIS)
- Inspections and Maintenance
- Electronic Pressure Monitoring
  - Visibility to real time pressure data and system health

Secured Supply

Firm Transportation Agreements

T-1 and NSP Curtailment Capabilities

Customer Outreach

- Automated customer notifications
- Customer newsletter with tips and info
- Real-time outage map (online and mobile app)
- Facebook.com/UniSourceEnergy Services
- Twitter - @UESGas
- Call Center Customer Care Team available 24x7
- Mobile App
- Average monthly residential Summer bill estimated to average $27 per month or about 17 therms usage

UniSourceEnergy SERVICES

Reliability! It's our Commitment

UniSourceEnergy
SERVICES

ATTACHMENT

SOUTHWEST POWER POOL
(SPP)

APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS WORKSHOP

PRESENTATION

SPP Southwest Power Pool

Southwest Power Pool WESTERN ENERGY SERVICES

SUMMER PREPAREDNESS

Working together to responsibly and economically keep the lights on today and in the future.

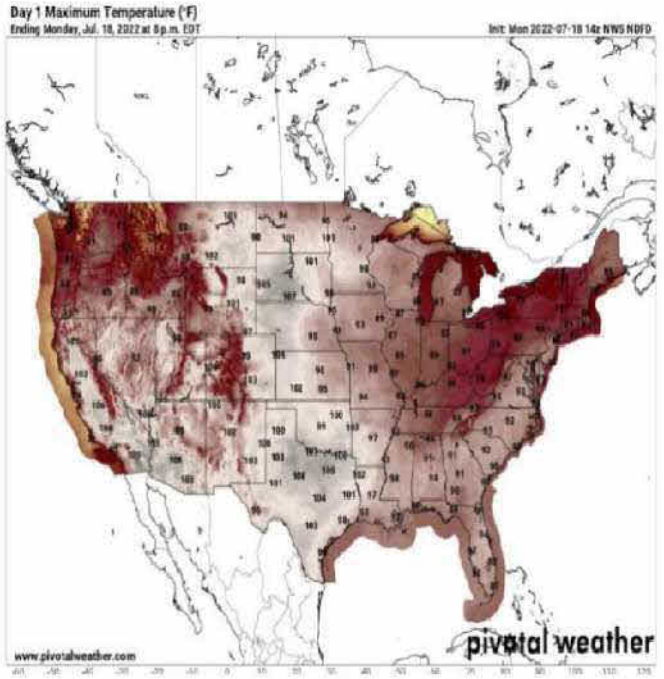
SouthwestPowerPool SPPorg southwest-power-pool

TOPICS

- Preparation
  - Extreme Weather
  - Wildfires
- Seasonal Assessments
  - Sub-regional Study Groups
  - Water outlook

PREPARATION

- Extreme weather
  - SPP West RC Area Peak Load:
    - 20.1 GW set in July 2022 heat wave
- Daily weather report
  - West RC's receive a daily weather forecast for the current and next day system conditions broken down by region.
  - West RC's monitor conditions to identify real-time extreme weather conditions that may impact the operation of the BES.



The National Weather Service's forecast for high temperatures Monday. (Pivotal Weather) (Pivotal Weather)

PREPARATION

- SPP West RC Watch Process
  - This process initiates blast calls to the membership for the Rocky Mountain and Desert Southwest regions for real time and forecasted extreme conditions such as the following:
    - Total load in the region is projected to be within 10% of previous year's peak
    - Entity reporting to SPP West RC of any concerns with generation deficiencies
    - Entity reporting to SPP West RC extreme weather conditions
    - Entity reporting to SPP West RC widespread fires that may impact any of the major paths
    - Entity reporting condition that could adversely impact the BES

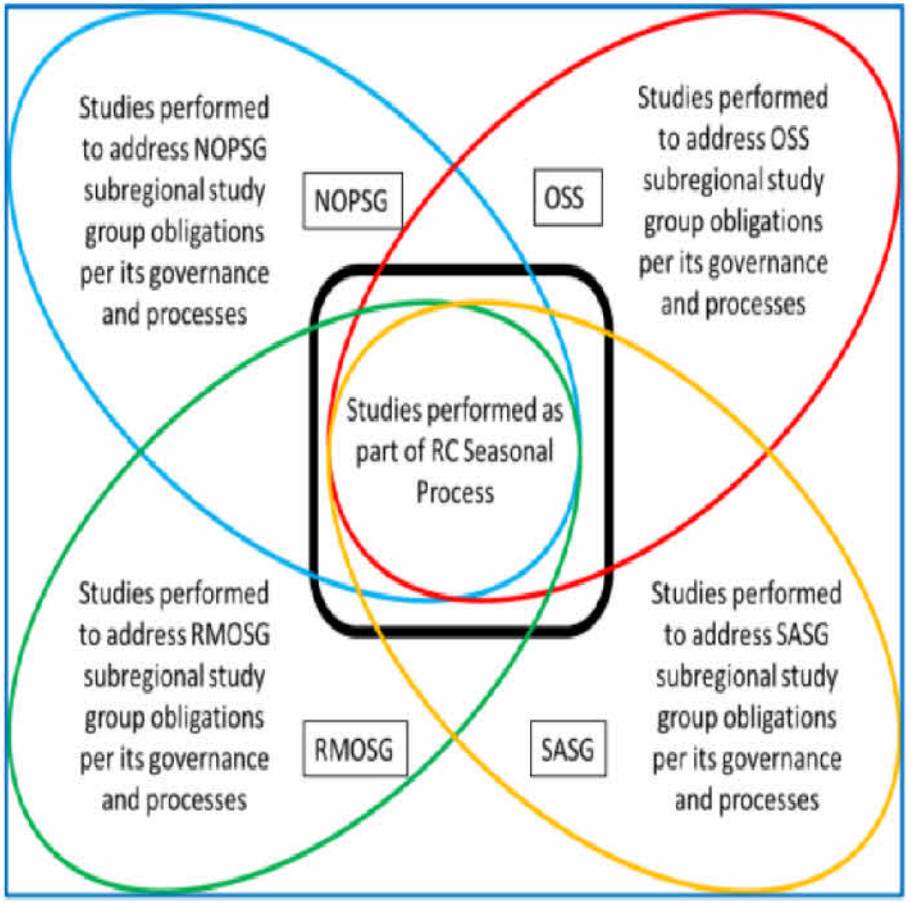
Southwest Power Pool WESTERN ENERGY SERVICES

PREPARATION

- Wildfires
  - Average to above-average risk in most areas.
  - Not all areas received the large amounts of rainfall. Those that did still face risk of wildfires later in the season.
- Fire monitoring Applications:
  - Macomber Map: This application has a wildfire overlay that is updated in real-time and indicates the size of the fire as well as the proximity to BES facilities.
  - WECC Wildfire Dashboard: Common tool available to all RCs and TOPs indicates active fires, proximity to transmission equipment, as well as the size and containment percentage of the wildfires.

SEASONAL ASSESSMENTS

- Sub-regional study groups
  - SPP participates in the sub-regional study groups and coordinates as needed with the entities to resolve any identified reliability issues
  - Entities discuss study results, impactful transmission project work and significant changes in the generation fleet



SEASONAL UPDATES

- RTCA / RTLODF Changes for summer
  - RTCA / RTLODF have been updated with the updated ratings for summer conditions.
  - SPP West RC has identified conditions that may result in conditionally credible multiple contingency outages (N-2) and defined contingencies to represent those conditions.
  - SPP West RC monitors IROL's that are conditionally credible and evaluates the impact on real time operations such as conditions resulting in potential open loop.

WATER OUTLOOK

- SPP discussed the water outlook for the 2023 summer season during the most recent meeting with the Western Reliability Executive Committee (WREC)
  - Above average snowpack for the Western Slope
  - Short-term relief for long-term drought conditions
  - Depleted reservoirs have an opportunity to recover in the Upper Basin

SPP Southwest Power Pool

Southwest Power Pool WESTERN ENERGY SERVICES

SERVICES EXPANSION UPDATE

SPP RTO WEST AND MARKETS +

SPP RTO WEST ENGAGED PARTIES

- Nine entities evaluating RTO membership or expansion of facilities in RTO:
  - Basin Electric Cooperative (to include WMPA)
  - Colorado Springs Utilities
  - Deseret G&T Cooperative
  - Municipal Energy Agency of Nebraska
  - Platt River Power Authority
  - Tri-State G&T
  - WAPA Colorado River Storage Project (CRSP)
  - WAPA Rocky Mountain Region (RMR)
  - WAPA Upper Great Plains Region (UGP)

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Colorado Springs Utilities
It's how we're all connected

DESERET POWER
ELECTRIC COOPERATIVE

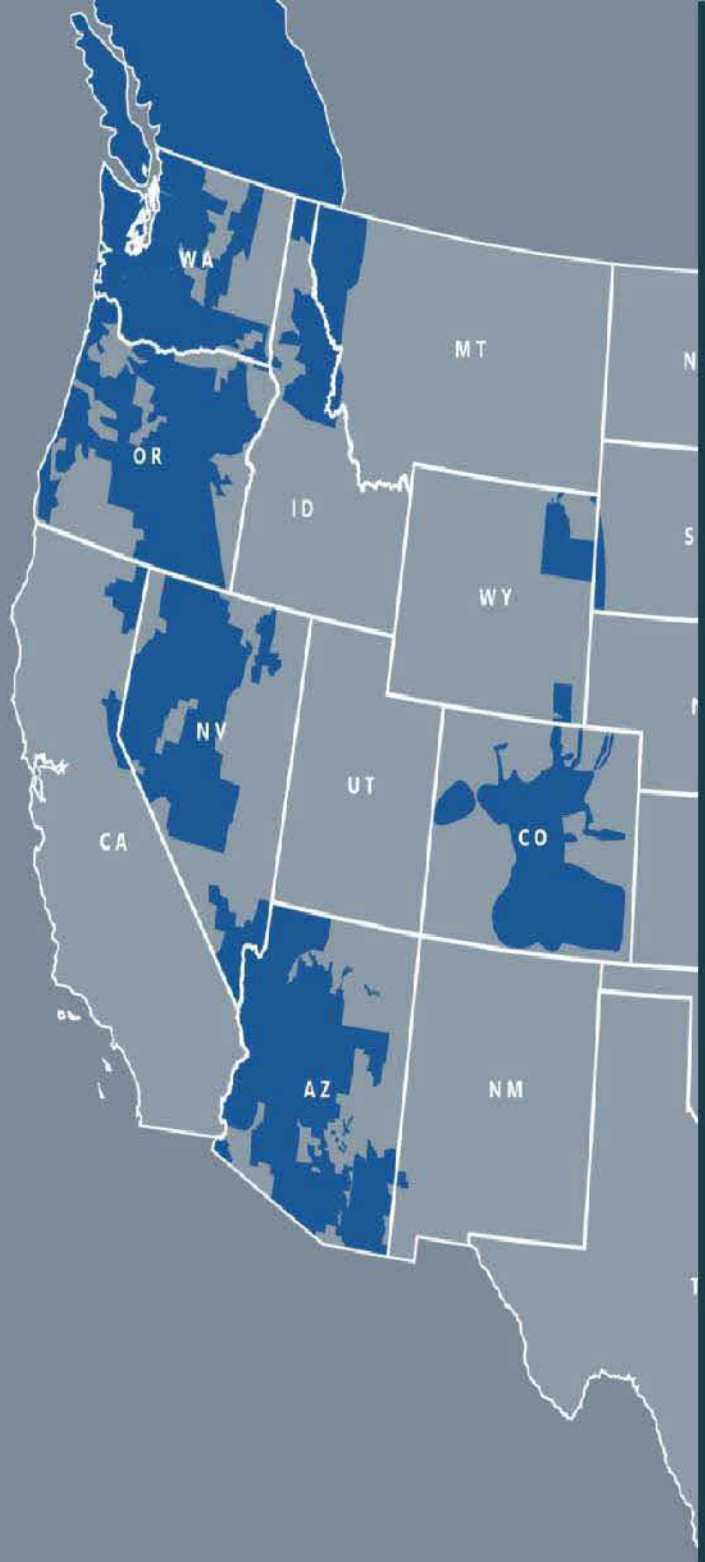
MEAN
MUNICIPAL ENERGY AGENCY OF NEBRASKA

Platte River
Power Authority

TRI-STATE

Western Area
Power Administration

Southwest Power Pool
WESTERN ENERGY SERVICES

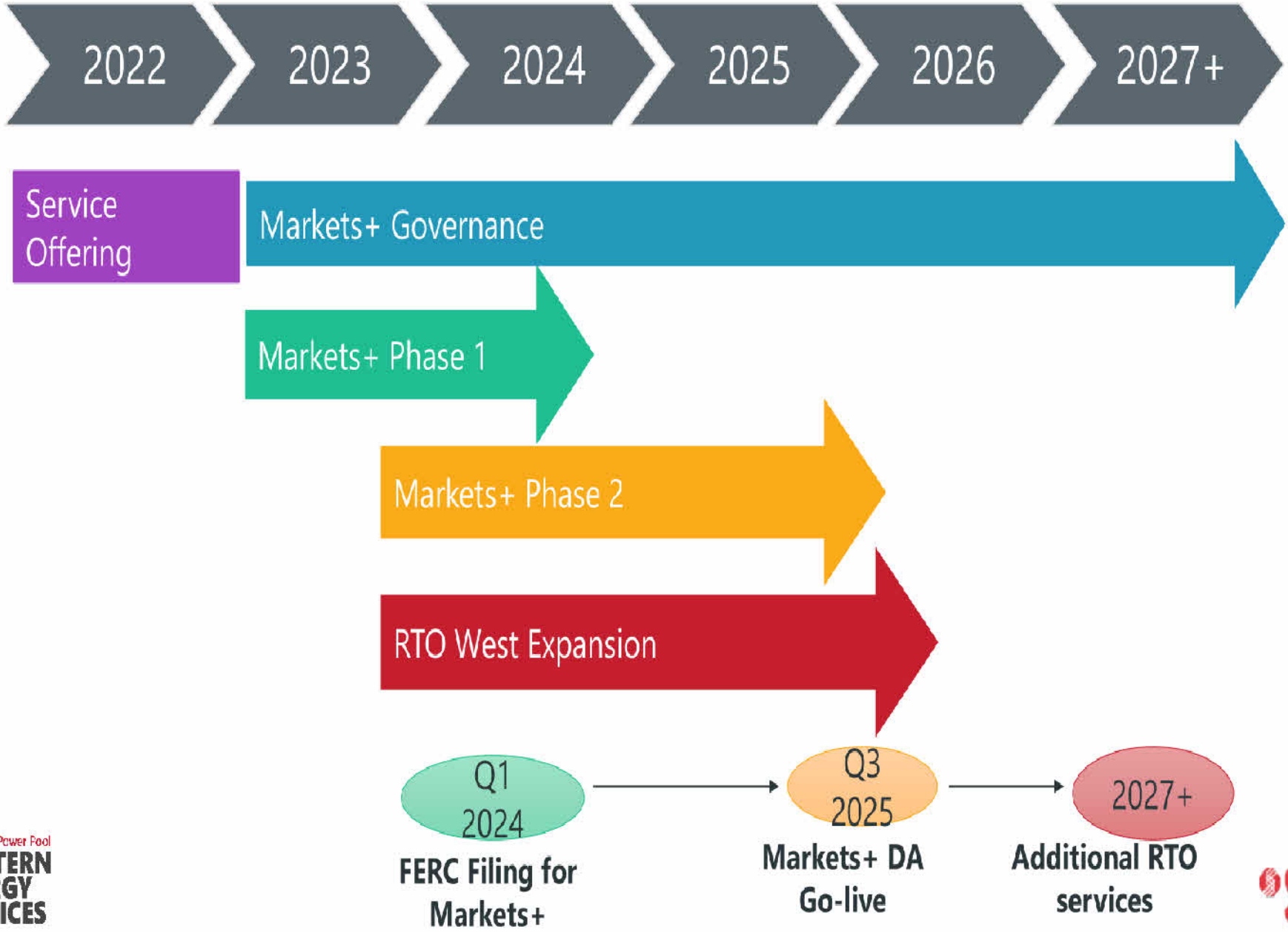


SPP Southwest Power Pool

Markets + Phase One

American Clean Power Association
Arizona Electric Power Cooperative, Inc.
Arizona Public Service
Basin Electric Power Cooperative
Black Hills Colorado Electric, LLC
Black Hills Power, Inc.
Bonneville Power Administration
Chelan County Public Utility District
Cheyenne Light, Fuel and Power Company
Clean Energy Buyers Association
Grant County Public Utility District
Interwest Energy Alliance
Liberty Utilities (CalPeco Electric), LLC
Municipal Energy Agency of Nebraska
Northwest & Intermountain Power Producers Coalition
NV Energy, Inc.
Pattern Energy
Powerex Corp.
Public Generating Pool
Public Power Council
Puget Sound Energy
Renewable Northwest Project
Salt River Project
Sierra Club
Snohomish County Public Utility District
Tacoma Power
The Energy Authority
Tri-State Generation and Transmission Association
Tucson Electric Power Company
Western Energy Freedom Action
Western Area Power Administration - Desert Southwest Region
Western Power Trading Forum
Western Resource Advocates
Xcel Energy-Colorado

TENTATIVE TIMELINES



ATTACHMENT

WESTERN RESOURCE ADEQUACY PROGRAM (WRAP)

APRIL 24, 2023, ENERGY RELIABILITY SUMMIT AND SUMMER 2023 ENERGY PREPAREDNESS WORKSHOP

PRESENTATION

WRAP
POWERED BY WPP

WESTERN RESOURCE ADEQUACY PROGRAM

Arizona Corporation Commission

April 24, 2023

Rebecca Sexton, Director of Reliability Programs

SOLVING A PROBLEM

- Resource Adequacy in the West has been conducted on utility-by-utility basis under individual IRPs or other local planning processes
  - No standardized method for measuring reliability risk or capacity contribution of resources
  - Utilities often must make broad assumptions about regional capacity availability that may not be accurate
- Implements a **binding forward showing** framework that requires entities to demonstrate they have secured their share of the regional capacity need for the upcoming season
- Implements a **binding operational program** that obligates members with calculated surplus to assist participants with a calculated deficit on the hours of highest need
- Leverages the binding nature of the operational program, together with modeled supply and load diversity, to **safely lower the requirements** in the forward showing and help **inform resource selection** for the region, **driving investment savings** for members and their end use customers

WRAP
POWERED BY WPP

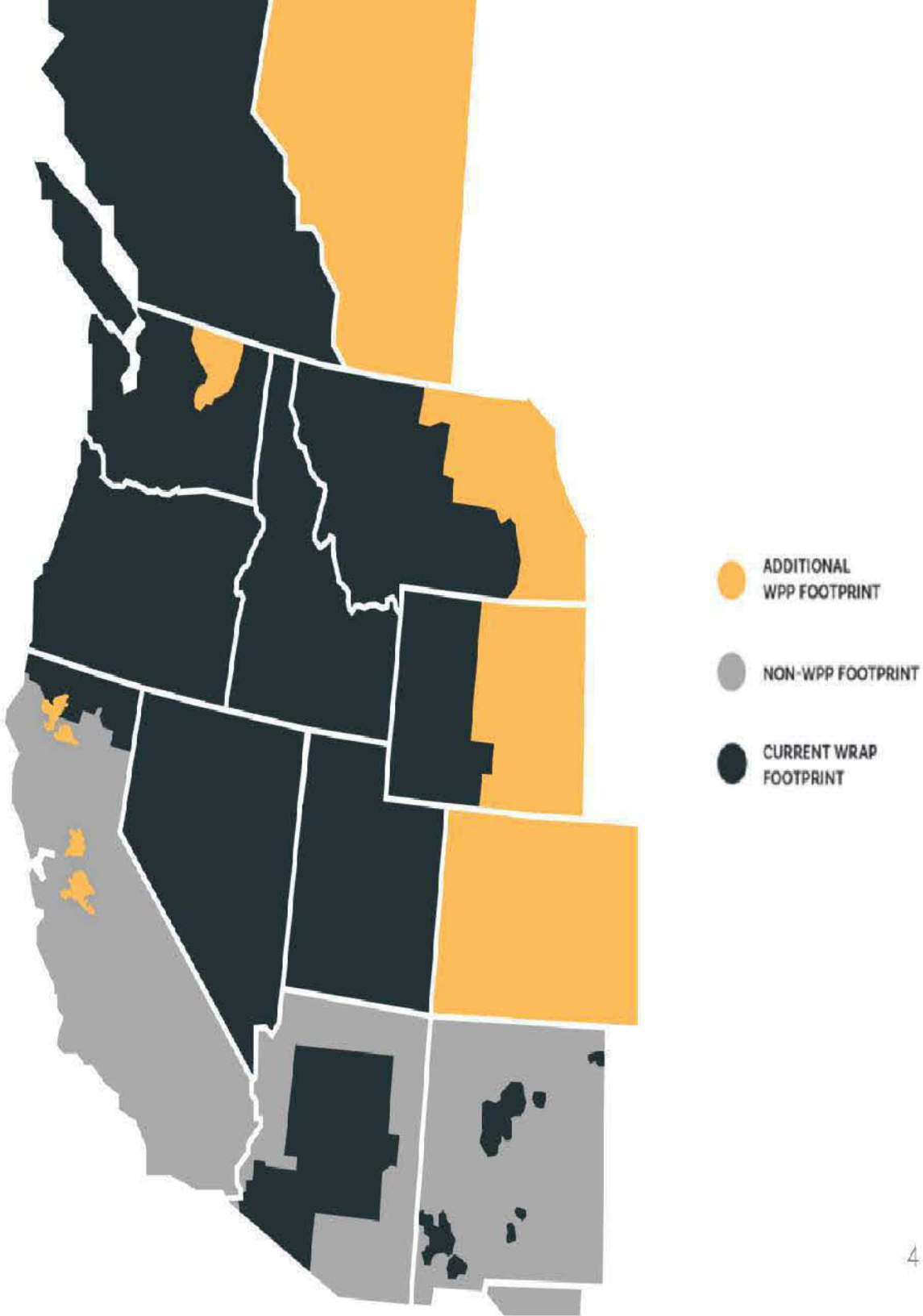
WRAP Value Proposition

- ***Reliability first-*** Implementing a west-wide resource adequacy (RA) program must be the priority for the region
  - Work on WRAP interoperability with markets is important and ongoing
- ***Diversity is key-*** WRAP benefits hinge on diversity of resources, loads, and transmission across a broad footprint
- ***Leadership opportunity is nigh-*** WRAP commitments send strong signal that the West can work together to tackle RA

WRAP
POWERED BY WPP

CURRENT PARTICIPANTS

Arizona Public Service
Avista
Bonneville Power Administration
Calpine
Chelan County PUD
Clatskanie PUD
Eugene Water & Electric Board
Grant PUD
Idaho Power
Northwestern Energy
NV Energy
PacifiCorp
Portland General Electric
Powerex
Public Service Company of New Mexico
Puget Sound Energy
Salt River Project
Seattle City Light
Shell Energy
Snohomish PUD
Tacoma Power
The Energy Authority



WRAP
POWERED BY WPP

PROGRAM DESIGN OVERVIEW

FORWARD SHOWING PROGRAM

- Establishes a **regional reliability metric** (1 event-day in 10 years LOLE)
- Utilizes thoughtful modeling and analytics efforts to:
  - Determine historical summer and winter **capacity critical hours** (CCHs) data sets for the region
  - Determine each resource type's **qualifying capacity contribution** (QCC) to the regional capacity needs
- **Planning Reserve Margin** is calculated by PO and approved by the BOD
- Resources are registered with and certified by Program Operator to receive a **Qualifying Capacity Contribution** (QCC) in advance of showing deadlines.
- Non-compliance with requirements (capacity *or* transmission) receives a **FS Deficiency Charge**

WRAP
POWERED BY MP

PROGRAM DESIGN OVERVIEW

OPERATIONS PROGRAM

- Evaluates participants operational situation relative to Forward Showing assumptions (for load, outages, VER performance)
  - PO runs advisory sharing calculation beginning 7 days prior to operating day
- Obligates participants with calculated surplus to assist participants with a calculated deficit on the hours of highest need
- Deficiency forecast on day before Operating Day (Preschedule Day) establishes Holdback Requirement for surplus participants
  - Obligation is allocated pro-rata to surplus participants
- Surplus Participant that fails to provide assigned Energy Deployment must pay Energy Delivery Failure Charge
  - Waivers will be available for specific circumstances

$$\textbf{\textit{Sharing Requirement}} = [P50 + PRM - \Delta\, Forced\ Outages + \Delta RoR\ Performance + \Delta VER\ Performance] - [Load\ Forecast + \Delta CR + Uncertainty]$$

WRAP
POWERED BY MPP

WRAP Development Timeline

WRAP
POWERED BY WPP